AQUIDNECK ISLAND PASSENGER RAIL/ BICYCLE PATH PROJECT

Towns of Tiverton, Middletown, and Portsmouth and
City of Newport, Rhode Island

TASK II
DESIGN CONCEPT REPORT

September 2002

AQUIDNECK ISLAND PASSENGER RAIL/BICYCLE PATH PROJECT
TOWNS OF TIVERTON, MIDDLETOWN, AND PORTSMOUTH AND CITY OF NEWPORT, RHODE ISLAND

Task II
Design Concept Report

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1.0 INTRODUCTION

Aquidneck Island experiences high levels of roadway congestion during commuting hours and peak tourist season weekends. This project was undertaken as a follow-up to the Rhode Island Rail Corridor Feasibility study (RIDOT 1994) to explore ways in which the underutilized Newport Secondary Rail corridor can be used to serve the transportation needs of Aquidneck Island and Tiverton. It explores the range of public transportation alternatives, which could use this corridor to help relieve traffic congestion on the Island's roadways, particularly during peak commuting hours and the peak tourist season.

Corridor Uses
Five alternative uses were considered for the Newport Secondary Rail corridor

Alternative 1:	Dinner/Tourist Train Excursion Services as they are today
Alternative 2:	Existing Excursion Services plus a bicycle path
Alternative 3:	Scheduled passenger rail service is extended from Newport to stations at either Mt. Hope or Anthony Road and incorporates a bicycle path
Alternative 4:	Scheduled passenger rail service is extended from Newport to the Fall River, MA, MBTA station to provide commuter service to Boston. It incorporates a bicycle path within the rail corridor
Alternative 5:	A 2-lane on-island busway and bicycle path would be built between Newport and Anthony Road

The busway was dropped form further analysis because it would require two lanes for safety, which in turn would widen the transportation corridor, impact a much larger area, and cost over 40% more than other alternatives. However, passenger rail service can be restored and a bicycle path built within the existing rail corridor. One set of infrastructure improvements can satisfy the requirements for simultaneous operation of existing Excursion Service trains, an On-island visitor shuttle, and a commuter shuttle to Fall River, MA. The bicycle path and/or rail service can be added incrementally, provided the follow the proposed alignments.

Rail Service Alternatives
A set of alternative passenger service structures was developed to facilitate evaluation of rail facility improvements. Each alternative can include the existing excursion services and the proposed bicycle path. The alternatives considered in detail include:

- *Year-Round On-island Shuttle between Mt. Hope Terminal and Newport:*
  A half-hourly shuttle service between Mt. Hope and Newport during the hours of 8AM till 11PM on weekdays. The service would include two intermediate stops, at Melville and Ranger Road.

- *Seasonal On-island Shuttle between Mt. Hope Terminal and Newport*
  The year round on-island shuttle could also be operated on a seasonal basis during the summer and on weekends in the spring and fall. The service would include two same intermediate stops, at Melville and Ranger Road and would be operated predominantly for visitor trips with a higher one-way fare to achieve more favorable operating economics.

- *Year-Round On-island Shuttle between Newport Terminal and Anthony Road*
  A half-hourly shuttle scheduled between Anthony Road and Newport during the hours of 8AM till 11PM on weekdays. The service would include two intermediate stops, at Melville and Ranger Road.

- *Year-Round Fall River Commuter/Anthony Road Shuttle*
  Since the On-island shuttle and Fall River commuter services are oriented toward two distinctly different travel markets, overlaying them provides a shuttle service that approximates the half-hourly service to Anthony Road with the through service between Newport and Fall River.

Several variations of each potential service structure were analyzed to arrive at a single set of infrastructure improvements that would allow simultaneous operation of the existing excursion trains, an on-island rail shuttle, commuter rail service to Fall River, and the bicycle path.

Report

This report consists of three parts: **Executive Summary**, **Task I: Railroad Operations Report**, and **Task II: Design Concept Report**. Collectively, the three reports describe the process and technical requirements for proceeding with any of the alternatives that were studied. They are not intended to initiate environmental permitting, design, or construction. They are a resource designed to provide local decision makers with technical transportation information needed to help make land use planning and permitting decisions on the west side of the island and in Tiverton.

The **Task I: Railroad Operations Report** presents a detailed analysis of all aspects of operating rail service within the Newport Secondary Rail corridor. It presents 2020 ridership forecasts and summarizes the various possible service structures and railway equipment possibilities. It evaluates capital, operating, and maintenance costs, ridership and revenue forecasts, and presents a financial analysis, project labor obligations, and an economic analysis of the project. The Task I report also details existing public transportation service on Aquidneck Island.

The **Task II: Design Concept Report** describes the existing conditions within the rail corridor, the railroad infrastructure that is required, details the bicycle path design, and discusses potential environmental impacts and permitting requirements.

2.0 RAILROAD INFRASTRUCTURE

2.1 Introduction

The railroad infrastructure consists of the track and roadbed, stations and facilities, signals and communications, grade crossings, bridges and surface drainage. In order to determine the required infrastructure to support a rail service, as proposed herein, the existing conditions of the railroad infrastructure had to be established. This information was used to create a base line condition assessment on which the improvements and new facilities are to be built. The following sections present the existing physical conditions of the railroad infrastructure, and improvements and new facilities required to support the proposed operations. A set of plans showing the railroad infrastructure and abutting properties owners can be found in Appendix A. Proposed improvements and facilities are presented separately for each of the three service options. They are:

Table 2-1
Service Options

Description	From	To
Mount Hope Shuttle	MP 0	MP 10.1
Anthony Road Shuttle	MP 0	MP 12.4
Fall River Commuter Rail and Shuttle	MP 0	MP 18.5

The Mount Hope and Anthony Road shuttles, however, are On-island and do not require the reconstruction of the Sakonnett River Rail Bridge. The Fall River commuter rail and shuttle do.

2.2 Existing Conditions

2.2.1 General

The existing conditions of the 15.8 miles of the Newport Secondary, from the Rhode Island/Massachusetts state line to Newport, RI, were determined from a visual inspection of the line and a review of existing plans, records and other documents. The physical inspection was performed in the following manner.

- A walking inspection of a portion of the Newport Secondary was performed on April 5 and 6, 2001. The inspection began just south of the Sakonnet River Bridge at the northern end of the project, at approximate Milepost (MP) 13.1 in Portsmouth, and proceeded south to MP 0.0 in Newport, RI. A visual inspection of the track structure was performed, to include rail, ties, ballast, other track material (OTM) and the underlying and adjacent right-of-way (ROW).

- A walking inspection of the remaining 2.7 miles of the Newport Secondary was performed on June 21, 2001 from Tiverton, RI north of the Sakonnet River Bridge to the Rhode Island/Massachusetts state line at approximate MP 15.8. For the most part, the line was overgrown with vegetation and was impassable by foot.

The plans, records and documents reviewed include the following.

- The existing right-of-way and track map, dated May 1, 1982, supplied by the Rhode Island Department of Transportation (RIDOT).

- The Newport Secondary Track mileage chart provided by railroad personnel.

Maintenance records were not available at the time of the walking inspection.

The purpose of the track inspection was to provide an assessment of condition, based on the U.S. Department of Transportation Federal Railroad Administration (FRA) *Track Safety Standards* (49 CFR Part 213). A determination of the class of the track and necessary upgrades to support the proposed operations on the line was made, based on the condition found during the track inspection.

Based on the current timetable, the track is designated as FRA Class 1, which allows maximum operating speeds of 10 MPH freight and 15 MPH passenger. The inspection of the line, for the most part, corroborated the timetable speeds and corresponding FRA class of track. Details of the observations and findings of the inspection are presented in the following sections.

2.2.2 Track Geometry

The existing rail line follows the western shore of Aquidneck Island. The existing track has horizontal curves that vary from 1° 00' at several locations to 5° 30' at approximate MP 13 in the vicinity of the Sakonnet River Bridge. The gradient of the track is essentially flat throughout the project area, as it follows the shoreline. The grades vary from flat (0%) to a maximum of approximately 0.6%.

2.2.3 Track Structure

Rail - The existing rail that comprises the track structure is jointed and of varied weight and section from 80# ASCE to 112# RE. The majority of rail, however, is 80# ASCE and 107# NH. The rail was found to be in fair condition. The rail lengths also vary from 33 to 39 feet depending on the weight and age of the rail.

Cross Ties - The existing tie condition is generally fair to poor. The size of the ties varies. The majority of the ties were 6"x 8"x 8' with a mix of 7"x 9"x 8' ties. The tie spacing varied between 20" (23 ties per 39' rail length) and 24" (20 ties per 39' rail length). The observed conditions averaged between 7 and 11 good ties out of the average of 23 total ties per 39-foot length of rail. This number exceeds that required for FRA Class 1 condition (five good ties per 39-foot rail length in tangent track and curves with a degree of curvature less than 2°, and 6 good ties in turnouts and curved track with a degree of curvature greater than 2°).

Ballast - The ballast over the entire 15.8 miles of track in Rhode Island was observed to be fouled (i.e. overgrown and soil filled between and outside the rails). The ballast observed is primarily made up of cinders and gravel. For the most part, there are no ballast shoulders along the track structure.

Grade Crossings - There are 32 public and private crossings on the line, of which nine are signalized. The signalized grade crossings are located, as shown, in the following table.

Table 2-2
Signalized Grade Crossings

Milepost	Crossing Name	City/Town
MP 0.97	Admiral Kalbfus Boulevard	Newport
MP 2.13	Crossing "L", Warehouse Road	Newport[1]
MP 2.20	Crossing "K", Chandler Street	Newport[1]
MP 2.23	Crossing "J", Anderson Street	Newport[1]
MP 2.57	Crossing "I", Derektor	Newport[1]
MP 2.89	Crossing "H", Navy Gate 26	Newport[1]
MP 3.33	Crossing "F", Burma Road	Newport[1]
MP 6.43	New Crossing	Newport
MP 7.10	Stringham Road	Middletown

1. Crossing located on the Newport Navy Base.

Bridges - There are 29 bridges on the line. However, bridge inspections were not performed and an assessment of condition was not made during the inspection.

Turnouts - The majority of turnouts are number eights (measure of divergence of the passing or other track from the main track). The weight of the turnouts is dependent of the weight and section of the rail in which it is located. There are some No. 10 turnouts on the line. The switch timbers in the turnouts were found to be in

the same general condition as the cross ties in that area. In general the turnout steel is in fair condition. There were a number of switches to industrial sidings that were spiked out of service.

Other Track Material (OTM) - The 80# ASCE rail is supported on 6 ½"x 9" single shoulder (SS) tie plates. The tie plates were found to be in fair condition. The 107 # NH rail is sitting on 7 ½" x 10 ½" double shoulder canted (DSC) tie plates and were found to be in fair to good condition. The rail throughout the line is jointed and is connected by four-hole joint bars. The (track spike) spiking pattern observed in the field appeared to be good. However, due to the existing tie condition, many spikes were loose and raised up (from its driven position) or missing. Few or no rail anchors were observed along the line.

Drainage - Along the ROW, there are a number of areas where standing water was observed in the ditches. Drainage appears to be a problem in many areas along the ROW.

North of the Sakonnet River Bridge, the existing right-of-way is covered with heavy vegetation. There are also many areas that have standing water in what would be the track area. Along the ROW in the cut sections, there are drainage pipes that are discharging water onto the track structure. Many of the cross culverts are silted over, which adds to the existing drainage problem.

2.3 Project Description

2.3.1 General

The Newport Secondary track runs from Newport, Rhode Island at MP 0 to Fall River, Massachusetts at approximately MP 18.5. The track crosses the Rhode Island/Massachusetts State line at approximately MP 15.8. The existing rail line is mostly single track with a number of passing and industrial sidings. The approximate 2.7 miles in Massachusetts are included in this analysis because of the Fall River commuter rail and shuttle service option.

The Newport Dinner Train and the National Railroad Foundation Museum operate from MP 0 in Newport, RI to approximate MP 8.5 north of Kings Grant Development. There is a washout at the bridge in the vicinity of MP 8.2. Therefore, the railroad has only been operating to approximate MP 8.0 until the washout and track are repaired. As stated previously, the track is considered to be FRA Class 1, which permits a passenger train to operate at 15 MPH maximum.

One of the major problems on this line is drainage. There are many locations that have drainage pipes discharging onto the railroad right-of-way. There are also cross culverts that do not appear to be sized properly to carry the runoff that is presently generated along and adjacent to the right-of-way. This can be attributed in part to the growth in adjacent development and land use. Many of the cross culverts are also blocked with silt and debris, which compounds the situation.

A number of industrial sidings along the line are no longer in service. The service has stopped since the Sakonnet River Bridge has been taken out of service in 1988. The Providence & Worcester Railroad (P&W) has stopped operating the line. For this study, it is assumed that all industrial sidings have been removed and only the sidings required for the operation of the passenger and excursion train operations have been considered.

For the combined Fall River commuter service and On-island shuttle, the following passing sidings and station tracks have been proposed.

- In the vicinity of MP 2.0, there is a proposed siding for the shuttle service located to the west of the main line track. At Newport station, there are two station tracks proposed. One is for the commuter service and one for the shuttle service.

- At approximate MP 4.3, a proposed passing siding for the shuttle service is located on the west side of the main line track.

- In the vicinity of MP 7.0, there are five proposed tracks to the west of the main line. Three tracks are for the commuter rail layover facility and two tracks for excursion trains. A layover facility building is proposed in the area for the storage, maintenance and repair of the commuter rail cars.

- At approximate MP 7.1, there is a proposed station track for the Melville commuter rail station on the west side of the main line.

- At approximate MP 7.3 on the east side of the main track, there is a proposed passing siding for the shuttle service.

- At approximate MP 12.4 on the east side of the main line, there is a proposed station track for the Anthony Road Station.

These passing and station track locations are required for the combined operation of the commuter rail and shuttle service.

There are a number of railroad bridges along the line over roadways and/or streams or creeks. Prior to instituting a FRA Class 3 (60 MPH) passenger railroad service, all the bridges on the line should be inspected and rated to ensure that they are able to accommodate the additional impacts of a FRA Class 3 operation. It has been assumed for this report that all the bridges will have to be replaced.

2.4 Rehabilitation Options

The following summarizes the operating requirements of the service options and required new infrastructure and improvements.

2.4.1 Mount Hope Shuttle Service

This option would provide a half-hourly On-island shuttle service between Newport and a proposed station at approximately MP 10.1 in the Mount Hope area. The service would require new continuous welded rail (CWR), signalized track infrastructure and a passing siding in the Melville area at approximate MP 7.1.

2.4.2 Anthony Road Shuttle Service

This option would provide a service that exceeds the thirty minute proposed headways for an On-island shuttle service. It would operate from Newport to a station just south of Anthony Road at approximate MP 12.4. This service would require new CWR, signalized track infrastructure, with a passing siding at Melville area, and with a station track at the proposed Anthony Road station area.

2.4.3 Fall River Commuter Rail and Shuttle Service

The combined commuter rail and shuttle service will provide a half-hourly service to Anthony Road and a separate through service to Fall River, Massachusetts. Two station tracks are also required at Newport Station for this service option. Proposed sidings are required at approximate MP 2.0, MP 4.3, and MP 7.1 for the excursion trains, and at Melville at MP 7.1 and Anthony Road at MP 12.4. There is also a five track yard at approximate MP 7.0 for storage and maintenance of the rail cars for both the commuter rail and shuttle equipment. A layover facility is also proposed in the Melville area.

2.5 Infrastructure Improvements

2.5.1 Track and Roadbed

The right-of-way from Newport to MP 8.5, north of Kings Grant Development in Portsmouth, Rhode Island, is currently in service and is operated by the Newport Dinner Train and the National Railroad Foundation Museum. The right-of-way width varies from a maximum of 208.50 feet in Portsmouth at approximate MP 7 to an average of 82.50 feet throughout the other areas of the line.

The track appears to be in FRA Class 1 condition (10 MPH freight, 15 MPH passenger) from Newport through Middletown into Portsmouth. For all proposed service options, the track is planned to be upgraded to FRA Class 3 (40 MPH freight, 60 MPH passenger). In order to achieve this, a complete track reconstruction program would be required along this segment of the line. New 115# RE section CWR should be installed on wood ties. Specialty track work, which includes welded turnouts, would be installed at designated passing track locations. Minimum standards would require that mainline turnouts be Number 10s. The turnouts for the storage and maintenance track should be No. 8s.

Grade crossings should be replaced to current Rhode Island Department of Transportation standards for both track and signals. The grade crossing improvements should consist of new 115# RE (minimum size/weight) CWR with high type crossing surfaces (full depth virgin rubber). Flashers and four quadrant gates should be used.

2.5.2 Stations and Facilities

The proposed station and facilities improvements consist of stations, a maintenance facility and terminal station in Newport, RI. The station improvements include the following components:

- 100'-150' long platforms.
- Canopy shelters.
- Parking lots.

Based on the availability of adjacent land, parking, platform length and the number of platforms vary. Some stations have station tracks, while some will load and unload on the main track. Also the service options determine the station components. Where there are two platforms, there are pedestrian crossovers between the tracks. Figures 2-1 and 2-2 depict typical one and two platform stations.

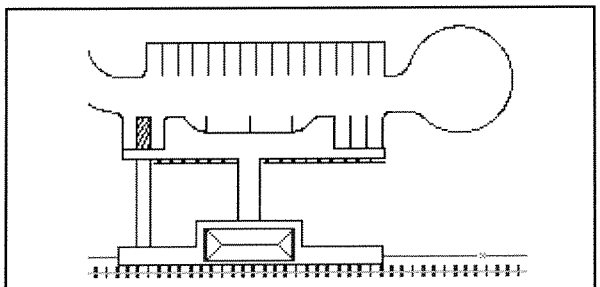

Figure 2-1 One Platform Station

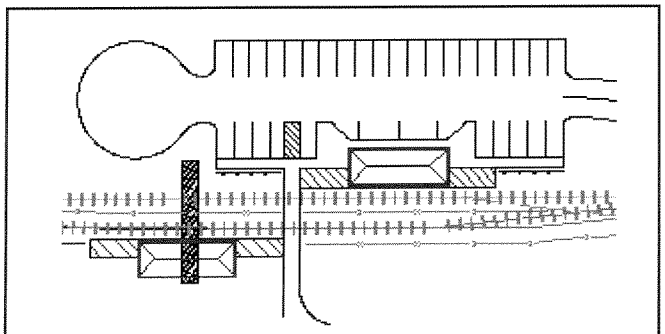

Figure 2-2 Two Platform Station

In the vicinity of the Melville station a proposed layover facility is planned. It will have sufficient length to accommodate two cars and sufficient width to accommodate three tracks inside the building. The proposed layout of this facility is presented in Figure 2-3.

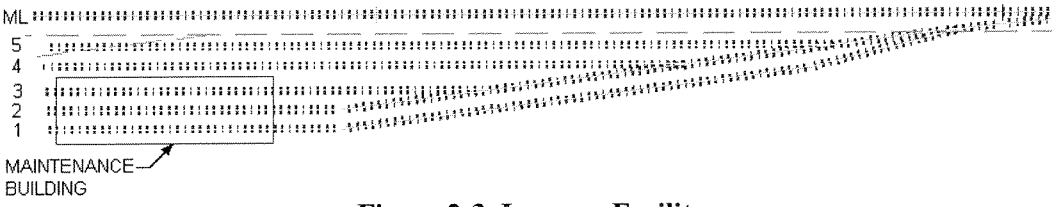

Figure 2-3 Layover Facility

The following paragraphs and tables further define the stations for each of the service options.

For the *Mount Hope Shuttle Service*, three station locations are proposed in addition to the Newport terminal. They are presented in the following table.

Table 2-3
Mount Hope Shuttle Stations

Station Name	Milepost	Station Platforms	No. Tracks	Remarks
Newport	0	2	3	Paid parking in vicinity of station
CCRI	1.7	1	1	Parking on one side
Melville	7.1	2	2	Parking on one side
Mount Hope	10.0	1	1	Parking on one side

The stations for the *Anthony Road Shuttle* service would be the same as for the Mount Hope Shuttle Service except that the Mount Hope Station would move to the Anthony Road area. The stations are presented in the following table.

Table 2-4
Anthony Road Shuttle Stations

Station Name	Milepost	Station Platforms	No. Tracks	Remarks
Newport	0	2	3	Paid parking in vicinity of station
CCRI	1.7	1	1	Parking on one side
Melville	7.1	2	2	Parking on one side
Anthony Road	12.4	2	2	Parking on one side

For *Fall River Commuter Rail and Shuttle Service*, the proposed station locations would require additional station locations at Tiverton and Fall River. The stations for this service option are presented in the following table.

Table 2-5
Fall River Commuter Rail and Shuttle Stations

Station Name	Milepost	Station Platforms	No. Tracks	Remarks
Newport	0	2	3	Paid parking in vicinity of station
CCRI	1.7	1	1	Parking on one side
Melville	7.1	2	2	Parking on one side
Anthony Road	12.4	2	2	Parking on one side
Tiverton	13.7	1	1	Parking on one side

2.5.3 Signals and Communications

A complete new signal and communications system would be required for the start up of a commuter or shuttle rail service or for overlay service of any kind. The major objective of the signal and communication system for the proposed service is to:

- Provide safe, efficient and on-time train operations in areas where no train service currently exists.
- Where current rail service is infrequent.
- Where maximum line speeds are greater than 15 MPH.

A centralized traffic control (CTC) signal system is proposed for this line with new railroad-highway grade crossing warning devices for each crossing. The proposed sidings will also be signal controlled within the CTC. A new circuit coupler for the opening and closing of electrical circuits between bridge ends of the Sakonnet River Bridge will also be required. The layout, signal spacing, etc. of the CTC will be determined during the design of the project.

2.5.4 Grade Crossings

In all service scenarios, the goal is to ensure maximum safety at all railroad-highway grade crossings. This goal takes into account the proposed maximum passenger train speeds of 60 MPH, a resumption of train service in areas that have been without service for 14 years and the integration of frequent passenger service into areas now served by occasional slower speed (15 MPH) excursion trains.

To meet state and railroad standards for passenger service, the crossings will be upgraded with new signals and gates. If a "whistle ban" is instituted along the line, then four quadrant gates shall be used. Crossing surfaces shall be new high-type rubber. The new 115#RE rail would be placed in all of the crossings. The existing crossing surfaces should be removed and crossing areas reworked from the sub-grade up to provide maximum crossing surface life, allow for the installation of new signal conduits, and provide for the best transition possible into the crossing area for both automobile and trains. Grade crossing locations and protection are presented in Table 2-6.

Table 2-6
Grade Crossings on Newport Secondary

Mile Post	Location	City/ Town	Signals	Proposed Protection
0.00	Elm Street	Newport	No	New Signals, Gate & Pavement Markings
0.01	Popular Street	Newport	No	New Signals, Gate & Pavement Markings
0.93	Admiral Kalbfus	Newport	Yes	New Cantilever Signals, Gates & Pavement Markings
2.13	Crossing "L" Warehouse Crossing	Middletown	Yes	New Signals, Gates & Pavement Markings
2.20	Crossing "K" Chandler Street	Middletown	Yes	New Signals, Gates & Pavement Markings
2.33	Crossing "J" Anderson Street	Middletown	Yes	New Signals, Gates & Pavement Markings
2.57	Crossing "I" (Derektor)	Middletown	Yes	New Signals, Gates & Pavement Markings
2.89	Crossing "H" at Gate 26	Middletown	Yes	New Signals, Gates & Pavement Markings
3.17	Crossing "G"	Middletown	Closed	---
3.33	Crossing "F" Burma Road	Middletown	Yes	New Signals, Gates & Pavement Markings
3.82	Crossing "E" (Dump Xing)	Middletown	No	New Signals, Gates & Pavement Markings
4.19	Pedestrian Crossing		No	New Signals, Gates & Pavement Markings
4.67	Crossing "D"	Portsmouth	No	New Signals, Gates & Pavement Markings
5.62	Crossing "C"	Portsmouth	No	New Signals, Gates & Pavement Markings
6.43	New Crossing	Portsmouth	Yes	Update East Signals & Add Gates & Pvmt
6.54	Dump Crossing	Portsmouth	No	New Signals, Gates & Pavement Markings
6.85	Foster Wheeler (Private)	Portsmouth	No	New Signals, Gates & Pavement Markings
7.05	Stringham Road (Melville)	Portsmouth	Yes	New Signals, Gates & Pavement Markings
7.48	Burnbe Avenue	Portsmouth	No	New Signals, Gates & Pavement Markings
8.21	Cory's Lane	Portsmouth	No	New Signals, Gates & Pavement Markings
8.86	Golf Cart Crossing	Portsmouth	No	New Signals, Gates & Pavement Markings
9.05	Golf Course Service Road	Portsmouth	No	New Signals, Gates & Pavement Markings
9.34	Willow Lane (Public)	Portsmouth	No	New Signals, Gates & Pavement Markings
9.99	Weyerhauser Plant Crossing	Portsmouth	No	New Signals, Gates & Pavement Markings
10.07	Farm Crossing	Portsmouth	No	Stop Signs & Pavement Crossing Signs
10.87	Farm Crossing	Portsmouth	No	Stop Signs & Pavement Marking Signs
10.97	Bay View Road	Portsmouth	No	New Signals, Gates & Pavement Markings
11.26	Crossing (Private)	Portsmouth	No	Stop Signs & Pavement Crossing Signs
11.95	Crossing (Private)	Portsmouth	No	Stop Signs & Pavement Crossing Signs
12.43	Anthony Road (Private)	Portsmouth	No	New Signals, Gates & Pavement Markings
14.37	Crossing	Tiverton	---	---
15.42	Crossing	Tiverton	---	---
15.52	Crossing	Tiverton	---	---

A reconstructed crossing surface area would allow the project to meet existing street geometry and make corrections (vertical and horizontal) in railroad grade and alignment in these areas, which would reflect standards of RIDOT, American Railway and Maintenance-of-Way Association (AREMA) and Manual on Uniform Traffic Control Devices (MUTCD).

2.5.6 Bridges

There are 29 bridges on the Newport Secondary Track. Nine of the structures are overhead roadway bridges (OH) and the remaining 20 bridges (UG) are over waterways or roadways. Two of the overhead bridges have been removed. They are at Bradford Road in Portsmouth and Walnut Street in Newport.

Prior to starting up a commuter rail or shuttle service on the line, the existing undergrade structures should be inspected and a bridge rating performed. The following table summarizes the bridges on the line.

Table 2-7
Bridge Locations on Newport Secondary

Crossing	UG/OH	MP	City/Town
Carey Lane	UG	13.88	Tiverton
Osborne Road	OH	13.68	Tiverton
Barkers Road	OH	13.58	Tiverton
Riverside Drive	UG	13.14	Tiverton
Sakonnet River	UG	12.99	Portsmouth/Tiverton
Anthony Road	UG	12.45	Portsmouth
Town Pond Tideway	UG	11.40	Portsmouth
Old Ferry Road	UG	10.85	Portsmouth
Mt. Hope	OH	10.82	Portsmouth
20ft Stone Arch	UG	8.79	Portsmouth
Fishers Road	OH	8.66	Portsmouth
Pedestrian Underpass	UG	8.14	Portsmouth
Mott's Road & Stream	UG	7.59	Portsmouth
Bradford Road (Closed)	OH	7.16	Portsmouth
Stream & Farm	UG	6.15	Portsmouth
Stone Arch & Farm	UG	5.42	Portsmouth
Cattle Pass	UG	4.97	Portsmouth
Cattle Pass	UG	4.84	Middletown
Greens Lane	UG	4.51	Middletown
21' Stone Arch Bridge	UG	4.48	Middletown
Browns Lane	UG	3.69	Middletown
Chases Bridge	OH	2.46	Middletown
Bridge	UG	2.28	Middletown
Chases Road & Stream	UG	2.07	Middletown
Coddington Highway	OH	1.63	Newport
Stone Arch Bridge	UG	1.13	Newport
Ramp to Newport Bridge	OH	0.62	Newport
Van Zandt Road	OH	0.36	Newport
Walnut Street (Closed)	OH	0.15	Newport

For the purpose of this report, it was assumed that all the undergrade structures would be reconstructed.

2.5.7 Drainage

Along the Newport Secondary Track, drainage is a major issue. Extensive grading and ditching would be required to provide for positive drainage control along the track. Since the railroad has been in operation, a number of developments have been constructed adjacent to the railroad. Many of them have drainage discharging on the railroad right-of-way. Many of the cross culverts are not sized to accommodate the runoff

onto the track. Many of the cross culverts have silted over, compounding the problem. A drainage analysis will be required during design to determine the drainage impacts of the adjacent land uses and proposed track construction and station and facilities improvements on the track infrastructure drainage system(s).

2.6 Capital Improvement Costs

The construction costs associated with the establishment of the right-of-way for the three operating scenarios includes a complete restoration of roadbed, track, grade crossings, bridges and signals, and construction of new stations and ancillary facilities. The major components of the capital improvements are:

- The track would be upgraded and reconstructed to accommodate a desired maximum operating speed of 60 miles per hour.
- The grade crossings, signals and specialty trackwork would be constructed accordingly.
- The bridges would be reconstructed to accommodate axle and other loadings that would be typical of the equipment operating over the line and include applicable safety factors.

Estimated capital costs are itemized and presented in the following tables for each service options considered in this study.

Table 2-8
Mount Hope Shuttle Service Estimated Construction Costs

Item	Unit	Quantity	Unit Price	Amount
New Track Construction	MI	10.1	$753,000	$7,605,300
Existing Track Removal	MI	10.1	$6,000	$60,600
Typical Railroad Stations	EA	4	$150,000	$600,000
Typical Grade Crossings	EA	21	$300,000	$6,300,000
CTC Signals	MI	10.1	$600,000	$6,060,000
Repair Facility	LS	1	$500,000	$500,000
Drainage	MI	10.1	$100,000	$1,100,000
Subtotal				**$22,225,900**
+15% Contingency				**$3,333,885**
Total Mount Hope Shuttle				**$25,559,785**

Table 2-9
Anthony Road Shuttle Service Estimated Construction Cost

Item	Unit	Quantity	Unit Price	Amount
New Track Construction	MI	13.5	$753,000	$10,165,500
Existing Track Removal	MI	13.5	$6,000	$81,000
Typical Railroad Stations	EA	4	$150,000	$600,000
Typical Grade Crossings	EA	26	$300,000	$7,800,000
CTC Signals	MI	13.5	$600,000	$8,100,000
Repair Facility	LS	1	$500,000	$500,000
Drainage	MI	13.5	$100,000	$1,350.000
			Subtotal	**$28,596,500**
			+15% Contingency	**$4,289,475**
			Total Anthony Road Shuttle	**$32,885,000**

Table 2-10
Fall River Commuter Rail and Shuttle Service Estimated Construction Costs

Item	Unit	Quantity	Unit Price	Amount
New Track Construction	MI	18.5	$753,000	$13,930,500
Existing Track Removal	MI	18.5	$6,000	$111,000
Typical Railroad Stations	EA	7	$150,000	$1,050,000
Typical Grade Crossings	EA	30	$300,000	$9,000,000
CTC Signals	MI	18.5	$600,000	$11,100,000
Repair Facility	LS	1	$500,000	$500,000
Drainage	MI	18.5	$100,000	$1,850,000
			Subtotal	**$37,541,500**
			+15% Contingency	**$5,631,225**
			Subtotal	**$43,172,725**
Sakonnet River Bridge	LS	1	$27,425,000	$27,425,000
			Total Fall River Shuttle	**$70,597,725**

3.0 BICYCLE PATH

3.1 Introduction

The historic Algonquin trail that ran along the spine of Aquidneck Island and Route 138 in Tiverton has long since disappeared, replaced by an auto-dominated landscape unsafe and unclear to bicyclists and pedestrians. Only a few designated bicycle path routes exist outside of Newport.

The 15.9-mile bicycle path proposed in this study along the scenic coast will provide a safe, scenic, and continuous transportation option for users in Tiverton and connect the Portsmouth bank of the Sakonnet River to the Gateway Center in Newport.

3.2 Existing Conditions and Initial Concepts

3.2.1 Base Mapping

Site walks along the entire corridor length and Burma Road were performed in the spring of 2001. Using aerial photographs as the base, Opportunities and Constraints Plans were generated in June 2001 based on input from previous studies and the site walks (Figures 3-1 to 3-10).

3.2.2 Opportunities

Opportunities to enhance the proposed bicycle path and railroad experience were identified within and adjacent to the existing corridor. 12 locations were identified within the corridor as potential station sites. Criteria for identifying these areas include:

- Access to major highways, e.g. West Main Road, and parking areas
- Adequate spacing between stations
- Proximity to tourist attractions and major employment centers
- Maximum of four stations on-island to provide reliable frequent service and to lower capital & operating costs
- One station in Tiverton
- Available land

Resource Areas outside the corridor, such as open space, athletic fields, schools, and connections to other path systems, were identified. Additional resources mapped include those of historical significance. Desired views along the corridor indicate future potential for overlooks.

3.2.3 Constraints

Bridge and at-grade crossings present another layer of planning and design challenges with the addition of the bicycle path. Most of the existing bridges require widening to include the bicycle path. Areas of steep slopes and narrow corridors that have historically supported the railroad will require additional grading and earthwork. A reduction or relapse in drainage maintenance has left many areas of the corridor seasonally or in some cases permanently flooded (Figure 3-1, Tiverton). It was initially unknown whether wet areas would be considered wetlands or just areas of poor drainage due to lapses in maintenance.

Ownership conflicts and areas of encroachment onto railroad property represent a constraint that should be dealt with on a case-by-case basis. Additional constraints identified and primarily affecting the bicycle path include areas of high vehicular noise and areas of high wind.

3.2.4 Bicycle Path Types and Alignment

Existing on-road bicycle routes were identified. A preliminary layout was proposed based on the degree of modifications necessary to construct the bicycle path adjacent to the railroad: Paths on Grade require little to no grading and would be the cheapest to construct; Paths with Grading require minor to moderate grading and alignment modifications within the corridor. Paths on Structure include boardwalks and paths in areas that

require extensive grading and/or retaining walls. Paths on Structure are the most expensive paths to construct and are typically located in the most sensitive areas

An additional bicycle path route along the transportation R.O.W. corridor and adjacent to Burma Road was mapped but not included in the final Opportunities and Constraints Plans.

3.3 Design Concept Guidelines

3.3.1 Bicycle Path

Surfacing for the proposed bicycle path is to be bituminous concrete. The standard width is to be 12 feet. In areas of steep slope or narrow right-of-ways, path width may be reduced to 8 feet, the minimal distance required for 2-way traffic. Striping the middle of the path is proposed to designate 2-way traffic. Where applicable, the AASHTO Guidelines for Bicycle Path Design, revised most recently in 1999, shall be followed to ensure proper layout and design.

A 12'-wide boardwalk is proposed in wetland areas within the corridor. The pressure-treated timber boardwalk shall have rails and/or low bumpers based on height off the ground and may include overlook areas. Boardwalks can also be used on sloped areas to provide access to lower elevations (Figure 3-13). Pinned footing systems allow for minimum disturbance to an existing resource area, as heavy machinery is not required to drive the posts into the ground. In more sensitive areas where the soils are less stable, the use of helical piers is recommended.

Approximately 4.4 miles of Burma Road contain bicycle lanes that are to be used for this project. Minor improvements, such as signage and markings are proposed. In several other areas, as indicated on the plans, one-way bicycle lanes on existing roads are proposed. The lanes are to be striped, a minimum width of 5 feet, and shall not have any vertical obstructions closer than 2 feet from the edge.

3.3.2 Signage and Interpretive Features

Warning, directional and interpretive signage will encourage safety and highlight resource areas along the corridor. The MUTCD guidelines for signage and pavement markings will be used to for all warning signage. Areas identified on both the Opportunities and Constraints and Concept Plans, such as historic station locations and ferry landings, can benefit from the use of attractive, vandal-proof materials.

3.3.3 Grading and Drainage

Where possible, the bicycle path is to be crowned from the centerline, and pitched at no more than 2% towards the edges. If the path is cross-pitched, proper drainage techniques shall be used on both the upper and lower sides to collect and transfer water away from the path. The 2% cross slope shall extend a minimum of 2 feet on both sides of the path and remain clear of obstructions before returning to grade or becoming a swale. The path shall be graded at a maximum slope along the centerline of 4.9% to ensure accessibility along its entire length.

Retaining walls (no greater than 4' height) may be required in areas where the centerline of the railway and the existing topography limit the bicycle path to be constructed on-grade.

3.3.4 Entrance Treatments at Crossings

Entrance treatments occur at the intersections of the bicycle path and major road crossings (Figure 3-11). The use of collapsible or removable bollards will deter vehicular access onto bicycle paths while allowing controlled access for maintenance and emergency vehicles. Vernacular elements, such as split rail fencing, stone piers, and boulders can also be used to prevent vehicles from entering bicycle paths at entrances. Crossings that mark entrances to train stations can utilize more expensive custom gates and non-slippery, specialized pavements where the path meets the roadway.

Treatment of the private (minor) road crossings will be handled on a case-by-case basis at a later phase.

3.3.5 Fencing and Screening

An 8-ft height chain link fence is proposed between the bicycle path and railway. At intersections, the fence will transition down to 4-ft high for better visibility. Utilizing a tension wire in lieu of a top-rail will reduce the linear foot cost and make the fence more transparent. PVC-coated chain link fence is more expensive but will reduce long-term maintenance costs.

To screen industrialized landscapes from the bicycle path, a combination of wood screen fencing and planting is recommended. Initial cost, height, and long-term maintenance and replacement costs of the wood screen fencing are important factors in selecting the proper fencing.

3.3.6 View Management Areas

Several areas identified as view corridors on the Opportunities and Constraints Plans require initial management to enhance vistas. Selective removal of individual trees and shrubs, outside of protective areas, is recommended. Where possible, limbing up of large canopy trees and removal of invasive over non-invasive species, is recommended.

3.3.7 Planting

Creating plant communities that are self-sustaining, diverse, and low-maintenance is recommended within the transportation corridor and at the stations. On each side of the bicycle path, seeding with a conservation seed mix of native warm- and cool-season grasses and wildflowers is proposed. In areas of high disturbance or more shaded areas, shrub and tree seeds can be added to the mix.

In wetland and other protected resource areas, boardwalk construction on pier systems requires minimum planting as little to no disturbance is anticipated. If disturbance does occur, use of a native seed mix appropriate to the existing wetland plant community is recommended. For all seeding applications, proper preparation of the seedbed is required to ensure the establishment and long-term success of the project. Removal of the competitive seed bank and using appropriate seeding techniques will increase the chance of success. Once established, seeded areas need only be mowed once a year (preferably in the spring) to remove woody species.

At trailheads, crossings, and stations, the use of native or naturalized, non-invasive plants can aid in highlighting special areas: deciduous shade trees, evergreen trees for screening, flowering shrubs, and low-maintenance groundcovers. Permanent irrigation will not be necessary if the proper species are used; however, watering during the initial establishment period should be anticipated.

3.3.8 Parking and Amenities at Stations

Enlarged plans for each of the stations are shown in Figures 3-12 to 3-17. General criteria used for parking layout include: no dead-end circulation routes; provide drop-off areas adjacent to the platform on the passenger side of vehicles; utilize a cul-de-sac in situations where vehicles need to turn around to drop-off on the appropriate side; and provide accessible stalls and ramps sloped at less than 1:12. Concrete curbs, standard basin-type drainage, and site lighting were also assumed for the parking areas.
The number of parking spaces per station is as follows:

- Tiverton - none (parking at proposed Starwood mall area)
- Anthony Road/Mt. Hope - 100 each
- Melville - 30
- CCRI/Ranger Road - 20
- Newport - none (parking provided at Gateway Center)

Some specialty paving and low ornamental fencing is included in transition areas between the parking lot and platform. Other amenities include benches, trash receptacles, and bicycle racks. See Planting Section above for typical planting concepts for the stations.

3.4 Design Considerations at Special Areas

3.4.1 Tiverton Station

At the proposed site of the Starwood development there is an opportunity to create a scenic section along the water's edge just north of Carey Lane. Future siting of the Tiverton Station and associated parking needs to be closely coordinated between Starwood and RIDOT.

3.4.2 On-Road Bicycle Lanes (Tiverton)

The existing corridor between the Tiverton Station site and the Sakonnet Bridge is inundated with water and is fairly narrow. An opportunity to relocate the bicycle path from the corridor to on-road would provide for a more scenic experience. Improvements to Poplar and Riverside Drives include the addition of signage, striping, and securing the pavement edge.

3.4.3 Common Fence Point Area (Portsmouth)

Extending the bicycle path to the Sakonnet River allows use of the trail by residents north of the Anthony Road or Mt. Hope Station. Utilizing an existing maintenance road on adjacent public utility property creates an inexpensive solution for getting the bicycle path away from the active rail line.

Opportunities for interpretation include initial purchase of the island, settlement, use as a common grazing area, and connecting Tiverton to the island (Durfee's Ferry and historic bridge crossings).

3.4.4 Anthony Road Station (Portsmouth)

The Anthony Road Station includes two platforms and is an alternate site for the northern terminus to the On-island shuttle service (Figure 3-12). Easy access off of Route 138 and proximity to the Sakonnet Bridge make this an ideal location for the northern terminus. However, certain constraints, such as the realignment of Anthony Road and Route 138 and property line issues, will require more planning and coordination than the alternate Mt. Hope site. An alternate bicycle path route north of the station is possible. This route could follow and upgrade the existing maintenance road beneath the Narragansett Power Company's power lines.

3.4.5 Boyd's Marsh (Portsmouth)

A very narrow, elevated section of railroad corridor through Boyd's Marsh can be avoided by extending the path via boardwalk over the reconstructed tidal marsh (Figure 3-13). This option temporarily separates the railroad and path and allows for an overlook area for wildlife viewing. The opportunity for environmental education about the reconstruction and the significance of the tidal marsh, and the former Town Pond can be incorporated into the overlook through signage.

3.4.6 Mt. Hope Bridge Area (Portsmouth)

The historic Bristol Ferry Landing, railroad station, and construction of the Mt. Hope Bridge are key interpretive features in this area.

3.4.7 Mt. Hope Station (Portsmouth)

Adjacent to a wetland, the proposed single-platform station is the southernmost alternate location for the northern terminus (Figure 3-13). This site offers an open and sunny character with the bicycle path on the opposite side of the station. Landscape design features include wetland buffer planting and opportunities for historical interpretation (coal mining, location of the former Portsmouth station, and the timber shipping industry).

3.4.8 Stairway Crossing at St. Philomena School

An opportunity for improvement of the existing beach access and rerouting of the path away from the railway exist at the St. Philomena School (Figure 3-14). The current stairs do not meet code and drain a large area of lawn at the school. Diverting the uphill water and rebuilding the stairway using sound construction practices will improve access to the shoreline and allow for the separation of railway and path.

3.4.9 Melville Station (Portsmouth)

A 30-car parking lot and 2 platforms characterize the Melville Station (Figure 3-14). Siting of the parking east of the tracks makes it possible to park without crossing the tracks. The removal of the overhead span and support post on the defunct Bradford Avenue bridge make use of the corridor easier. A small park could benefit the Melville neighborhood if the parcel west of the station were incorporated with the bicycle path. Interpretive opportunities include wartime training facilities (JFK), boat building/active marina, and the adjacent Melville Campground.

3.4.10 Weaver Cove Public Boat Launch Access (Portsmouth)

Path users travelling from a distance and wishing to access the bicycle path may use the public boat launch area as a parking facility. Its proximity to the water and location near the midpoint of the bicycle path also make it a perfect location for a picnic/rest area.

It is also in this area for a distance of approximately 1.3 miles that the bicycle path could follow the adjacent public utility ROW. This area is already maintained through mowing and usually has a maintenance road that could be paved and used in conjunction with the bicycle path.

3.4.11 McAllister's Point (Middletown)

A passenger siding, just north of the Navy landfill, will afford spectacular views of the bay. The landfill could possibly function as a passive park at some future date, conveniently accessed from the bicycle path.

3.4.12 Navy Secure Area (Middletown)

Between Gate 17 and Chase's Lane, the bicycle path will follow the alignment of the existing sidewalk. This section of the multiuse path would be the only section of the bicycle path not considered handicapped-accessible (slope in excess of 5%). At Chase's Lane, construction of a separate bicycle path is possible by narrowing Chases Lane from 32 feet to 24 feet and utilizing the shoulder and narrow strip of Navy property. The path ties into the existing Navy path, using the same alignment and widening the path, and running west of the existing housing development (Figure 3-16). The existing path is constructed of concrete and should be reconstructed using bituminous concrete (asphalt). Combining the two trail systems would reduce maintenance, ensure that the path stays out of secure area, and eliminate the need to re-grade the steep embankment.

3.4.13 CCRI Station (Newport)

Access to the CCRI Station will be from Coddington Highway (Figure 3-16). The path winding down to the station will be accessible and accommodate users from the future CCRI campus and points north. Approximately 20 feet of grade change from Coddington Highway to the station will be accommodated between the entrance road and station. The location of the entrance road allows for future development adjacent to the highway.

3.4.14 Newport Station/Bicycle Path Terminus (Newport)

The bicycle path terminates at Poplar Street, as the railroad tracks split providing too little room within the corridor for the path to continue all the way to Bridge Street (Figure 3-17). The bicycle path continues as a 5'-wide bicycle lane on both sides of America's Cup Way. A small gateway pavilion marks the entrance to the bicycle path from America's Cup Way. Bollards or similar devices will be used to prevent vehicular access onto the path. Parking for the Newport Station is to be accommodated across Bridge Street at the

Gateway Center. The small parcel of land to the west of relocated Newport Station building could serve as a park or play area.

3.5 Operations and Maintenance

3.5.1 Bicycle Path

Bicycle facilities that become deteriorated due to neglect can easily become a liability. RIDOT, acting as trail manager, will be responsible for operating and maintaining the bicycle path. Signage at trailheads and stations should indicate the name and contact information for the trail manager. On-going maintenance activities include sweeping, re-striping, repairing path edges, shrub and tree pruning, biannual mowing, fence and bollard repair, and sign replacement. Retaining walls, drainage culverts, and erosion-prone areas may also require periodic maintenance. Replacement costs for path surfacing and boardwalk are assumed every 15 years.

Costs associated with policing and enforcing the bicycle path are the responsibility of the specific municipality involved.

3.5.2 Stations

The railroad operator will be responsible for operational, maintenance, and policing costs associated with the stations.

On-going maintenance includes plowing and sanding, sweeping, re-striping, cleaning drainage systems, replacing site light bulbs, mowing, weeding, pruning, trash removal, and graffiti removal. Resurfacing of the entire parking area is assumed to occur every 12-15 years.

3.6 Cost Estimates

3.6.1 Summary – Total Cost

The total cost for the bicycle path and stations is $7,698,500. The bicycle path component, approximately 15.9 miles, is estimated at $6,867,700. The estimate includes boardwalk, paved surfacing, drainage, retaining walls, gateways/entrance nodes, intersections, fencing, screening, planting, and signage. Site work at the five stations includes lighting, planting, bituminous concrete paving, curbing, drainage, special pavements, bollards/fences, and signage costs. Total station costs are estimated at $830,800. The bicycle path can be broken into discrete segments in order to facilitate a phased construction approach. These sections are summarized in the table and text below.

Table 3-1
Bicycle Path Cost Summary

Section	Bicycle path miles	Bicycle path cost	Proposed Stations	Station cost	Total Cost
Tiverton	2.6	$1,136,200	Tiverton Station	$44,900	$1,181,100
Anthony Road to Melville Station	5.8	$4,310,900	• Anthony Road or Mount Hope • Melville Station	$355,300 $172,100	$4,838,300
Burma Road (existing)	4.4 plus 0.3 miles of new shared roads	$24,900 (minor improvements, overlook, view management area)	---	---	$24,900 (minor improvements)
Gate 17 to Newport Station	2.8	$1,395,700 (includes fencing at gates from Gate 17 to crossing J)	• CCRI Station • Newport Station	$166,400 $92,100	$1,654,200
Total	**15.9**	**$6,867,700**	---	**$830,800**	**$7,698,500**

3.6.2 Tiverton

This section includes approximately 2.60 miles of bicycle path and the proposed Tiverton Station (parking not included). Total Cost of $1,181,100; The Tiverton Station cost is $44,900, and includes plantings, signage, benches, bike racks, and trash receptacles. The bicycle path component is $1,136,200.

3.6.3 Anthony Road to Melville Station

Includes approximately 5.84 miles of bikeway and two proposed stations: the northern terminus at either Anthony Road or Mount Hope (parking for 100 cars), and the Melville Station (30-car parking). This portion also includes the connection to the existing Burma Road bicycle lanes. The total cost of this section is $4,838,300. The Anthony Road (or Mt. Hope) Station costs a total of $355,300, the Melville Station is estimated at $172,100, and the bikeway component is $4,310,900.

3.6.4 Burma Road (Existing) Section

Includes Melville Station in Portsmouth to the Gate 17 Navy Crossing in Middletown. Total Cost of $24,900 for additional signage and pavement markings for 4.4 miles of existing bike lanes, 0.32 miles of new shared bike lanes (signage and markings only), one overlook, and one view management area.

3.6.5 Gate 17 Crossing (Middletown) to Newport Station

This section includes proposed fencing and gates from Gate 17 to Crossing J, a new bikeway along and through Navy property, the CCRI and Newport Stations, and the bicycle path terminating at Poplar Street. Total cost for this section is $1,654,200. The CCRI Station is estimated at $166,400 and the Newport Station is estimated at $92,100. 2.8 miles of bicycle path is estimated at $1,395,700.

3.6.6 Summary – Annual Maintenance Costs

The annual maintenance cost for the 15.9-mile bicycle path is $206,000, an average of $13,100 per mile. The breakdown of maintenance costs (tasks) is 70% labor, 30% materials. Maintenance includes both on-going repair and full replacement (see Bicycle Path Maintenance section for items included).

The annual maintenance cost for the stations, not including the shelters or platforms, is $31,200 (70% labor, 30% material costs). The annual maintenance breakdown for each station is as follows:

- Tiverton Station: $2,800 (maintenance of parking areas by others)
- Anthony Rd/Mt. Hope Station: $13,800 (100-car lot each)
- Melville Station: $6,200 (30-car lot)
- CCRI Station: $5,600 (20-car lot)
- Newport Station: $2,800 (no parking area)

Assumptions

- Platform and shelter costs not included
- Lighting of the bicycle path for night use is not anticipated
- A chain link fence is not proposed between boardwalk areas and railway
- Cost of a bicycle path that supports railroad maintenance vehicles is not included
- Cost of relocating the existing Newport Station structure is not included

4.0 ENVIRONMENTAL STRATEGY

An important component of the Rail/Bicycle Path Feasibility Study for the Aquidneck Secondary Railway is the identification of environmental features and conditions, which may present potential constraints for implementing any of the development alternatives. The primary environmental parameters of concern for this section of the study report are coastal and freshwater wetlands, flood hazards areas, and sites within the rail corridor or at potential station locations that may have been contaminated with hazardous materials or petroleum products in the past. This report presents the status and findings of the assessment of the rail corridor and station location alternatives.

All development and railway preservation alternatives, with the exception of "no action," present some environmental constraints. The rail corridor's location along the coast, and in some areas, directly adjacent to the Narragansett Bay Shoreline, will require careful planning and monitoring to avoid construction-related environmental impacts and minimize disturbances to the coastal and freshwater wetlands habitats and water resources. Potential for disturbance and impacts can come from rail and bike path construction activities and operations of the rail line.

Rail and Bike Path Project Implementation Permitting Requirements

Development of either new rail service or the bike path facility would require additional study and impact assessment before any alternatives can be implemented. Permitting requirements vary considerably between the bike path and rail service, as do associated potential impacts. Both federal and state-level regulatory review processes would be involved with either rail or bike path facilities.

Another element of concern for both the rail and bike path alignments is the need for additional studies (Phase II at a minimum) to determine the type and extent of contamination on properties adjacent to or in close proximity to the ROW. A Phase I Site Assessment Study was conducted for the rail corridor and properties within 400 feet of the corridor and is presented in Section 4.5. This study effort indicated that along some locations there may be threats of contamination migrating off-site from properties onto the rail corridor. Prior to developing the corridor for public recreation with a bike path, a Phase II Study should be undertaken at selected locations using applicable screening criteria to determine priority sites for further investigation. This is particularly true for the rail corridor in proximity to some Navy Properties.

Should the project proceed, a Phase II Environmental Site Assessment should be conducted to evaluate potential exposure to pedestrians and bicyclists. Evaluating surface and subsurface soil will consist of sampling for PAHs, VOCs, TPH, PCBs, DDT, and metals at Melville North Landfill, Melville Sludge Drying area, Melville Structure 214, McAllister Landfill, and Derektor Shipyard. In addition, at the dinner train staging area in Melville (milepost 7.1), Berger did not gain access to the vault for inspection. However, the vault should be thoroughly inspected for oil leakage.

Rail Service Considerations

Reintroduction of regular passenger rail service on Aquidneck Island would present a transportation mode, which most neighborhoods on the Island have not experienced, and would be seen as "new" for the island communities. The island, particularly the West Main Road region in the study area, is experiencing traffic congestion problems on main arteries, both on a summer seasonal basis, and with increasing frequency during regular commuter travel times. In response, several planning documents, including the Transportation Guide Plan by the AICP (2001), have identified the development of rail service on the Island within the existing rail corridor as meriting further study and presenting potential for alleviating transportation problems on the Island. However, land use patterns and densities have changed considerably since trains last traveled along the west shore.

An On-island shuttle rail service alternative which terminates at the Mt. Hope Station location would present the least amount of impacts to the environment and it would avoid impacts to a variety of important

environmental and social features, that an Anthony Road Train Station terminus would impact. Service to Anthony Road would bisect one-half mile of the Montaup Country Club Golf Course. The Anthony Road option would impact the neighborhoods within one-hundred feet of the track at Anthony Road, Bay View Avenue, Bristol Ferry Road, Musselbed Shoal Road (within 50-feet) and Brant Road. This option would entail rail improvements and travel through Boyd's Marsh, a valuable and critical saltmarsh area that is currently being restored by a coordinated federal/state/local and NGO project. The alternative would involve travel through the Mussel Shoals freshwater and saltmarsh complex an area of high ecological value and sensitivity. A Mt. Hope Station terminus for rail service would avoid these areas.

Reintroduction of rail service, even if limited to a Mt. Hope Train Station termination point, would still concern neighborhoods with respect to disruption, safety, and noise impacts. The need to replace the rail and ties for the entire length within, and close to sensitive coastal and freshwater wetland habitats and their buffers also presents potential for impacting regulated resources protected by Presidential Executive Orders and state and federal regulations.

Connection of an On-island shuttle rail service to a Fall River MBTA Station would involve an extension of new rail infrastructure (replacement) and two additional stations (Anthony Road and Tiverton at the Starwood Site), as well as impacting neighborhoods on Aquidneck Island north of the Mt. Hope location and in Tiverton. Extending rail service to Fall River an additional six miles and replacing the Sakonnet River Rail Swingbridge would require a much more extensive study effort.

Finding
Due to the magnitude and the potential impact of the major change in rail service to communities, the extent and location of required construction, and the need for federal resources for implementation, the project would in all probability require a full environmental impact study in accordance with National Environmental Policy Act (NEPA) of 1969, as amended.

Bicycle Path Facility Considerations
Construction of a bike path as proposed would present a different set of impacts and benefits to the communities and neighborhoods, as well as the natural environment. The bike path alignment would also extend to Tiverton. Bike paths are increasingly seen as non-intrusive, non-disruptive community improvements that contribute positively to individual health and become an aspect of community identity, as well as a destination point for families in a community, and visitors. (Source: *The Effects of Greenways on Property Values and Public Safety.* The Conservation Fund and Colorado State Parks, 1994. 76pp.)

Development of a bike path facility would not have the same degree of safety and noise impacts on neighborhoods and communities. The bike path would not involve the crossing restrictions nor the audible and visual warning devices required at rail crossings for the train service alternatives. Bikes produce less vibration when they pass, as well as much less noise. Property values for houses in the vicinity of a bike path facility have been found to either remain the same or increase, as cited in a 1992 study conducted by the National Park Service and other studies. (*The Impacts of Rail-Trails, A Study of Users and Nearby Property Owners from Three Trails*, National Park Service, Rivers Trails and Conservation Assistance Program, 1992.)

For nearly one-third its length, the bike path would remain on existing roads on Aquidneck Island in new or existing bikelanes on Burma Road, and in Newport. In other areas, the proposed bike path follows within the ROW, and would be buffered by space, fencing, and plantings from the track. In areas where the rail bed is on existing fill in wetlands or at steep grades, the bike path would be installed on fill material or raised boardwalks. Some wetland edge filling would be required at some of these locations and this would require permitting and review from the CRMC for both freshwater and coastal resources. At Boyd's Marsh and in vicinity of the Starwood Development site in Tiverton, plans for the bike path include crossing saltmarsh and beach areas. At Boyd's Marsh the bike path would traverse on boardwalk (in some areas on special piles) over approximately 300-feet of saltmarsh and a tidal channel, and another 1000-feet or so along higher

elevations of the beach. These are very sensitive resources, which are in the early stages of a coordinated, major restoration project. Plans for crossing the marsh and beach area would require a Category B Assent application to the CRMC and significant study efforts. As the Boyd's Marsh area is state property, which may also include a wildlife refuge area, study efforts may require a 4 (f) evaluation.

Plans for the bike path crossing beach areas also impact coastal resources at Starwood in Tiverton. This would also require CRMC Assent under a Category B application. Both areas offer scenic vistas along the coast, and both areas meet a critical Council goal of that, "...provides access to the shore for broad segments of the public." and may be approved under Section 130, for Special Exceptions. New crossings and associated filling or excavation for construction may require review and studies for subsurface archaeological resources (Personal communications, Rick Greenwood, RIHPHC 6/2002). Placement of bicycle boardwalk and support structures within the beach and marsh areas also occurs within a 100-year flood hazard and wave velocity zones, and these factors would have to be addressed in the study and mitigated appropriately.

Finding
It is estimated that development of a bike path facility along the proposed alignment, as shown within this study, would require an Environmental Assessment under NEPA. This would require the federal and state agency input and review, as well as public and community input and comment. The level of effort and study intensity would be less than a full EIS.

4.1 Wetlands

New amendments to the Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act (August 2001) developed between the Rhode Island Coastal Resources Management Council (CRMC) and the Rhode Island Department of Environmental Management (RIDEM), Office of Water Resources, identify the jurisdictional authorities of the two agencies for areas in proximity to the coast.

The rail corridor is designated as the jurisdictional border on Aquidneck Island and in Tiverton. The Rules state (specifically Rule 2.03 of the State of Rhode Island Regulations), that for all linear projects such as roads and utilities which are within 200 feet of a coastal feature, then the CRMC shall have the review authority for freshwater wetlands and coastal wetlands and habitats for the project. This new rule is meant to avoid duplication of effort for permitting tasks.

Wetland areas have been identified for the rail corridor and potential station locations using a combination of existing data sources (RIGIS Wetlands Mapping) and field investigations. Wetland identification is consistent with the Rules and Regulations Governing the Administration and Enforcement of the Rhode Island Wetlands Act. Figures 1-T through 14-N display the freshwater wetland and stream locations, flood hazard areas, as well as areas where coastal wetlands and habitats are in close proximity to the rail corridor. The numbering sequence of the figures begins with the Town of Tiverton (Figure 1-T) running south through Aquidneck Island and terminating with Figure 14-N at the Newport Gateway area.

Preliminary analysis estimated or determined the amount and type of wetlands within the right-of-way (rail corridor), or in close proximity, which would require protection or permitting for construction of any of the rail/bike path alternatives. The identification of locations and boundaries is meant to give a reasonable indication of the extent of wetlands in the rail corridor, and is not meant to take the place of actual field surveys to determine the exact limits and delineation for final permitting requirements.

Five project alternative scenarios were examined and four are addressed within the wetlands permitting strategy. They are:

1. No build;
2. Build the bike path and the dinner/tourist trains remain as is;
3. Build the bike path and provide On-island shuttle rail service to Mt. Hope or Anthony Road;

4. Build the bike path and provide On-island shuttle rail service and commuter rail connection to Tiverton and Fall River, and
5. Busway (dropped, as not practicable).

As the railroad already exists, potential impacts to wetlands stem primarily from construction of new facilities, and construction and implementation of the bike path alignment. The various rail service alternatives will present different infrastructure needs for new side passings and train stations, but in all cases, these have been sited to avoid impacts to freshwater and coastal wetlands. All new rail service alternatives include upgrading the track by removal of existing rails and ties, and installation of welded, seamless rail to accommodate faster and more frequent rail service. The rail bed would not be removed, but some additional bedding material would be added. A "no build," scenario for rail and the bike path will have no impact on wetlands, and leave them as they are presently.

Construction of the bike path alternative requires that, in some areas, the proposed bike path leaves the rail right-of-way corridor and cross wetland and coastal habitats. These locations have been identified during the constraint and opportunities tasks of this project and are presented in Figures 1-T through 14-N. Permitting requirements associated with all wetland and coastal impact areas from construction of the bike path and rail improvement are identified within this section of the report.

4.1.1 Rail Corridor General Drainage Conditions

The rail corridor was originally built in the 1860's and hugs the relatively flat coastline area for its length from Newport to the Fall River, Massachusetts/Rhode Island state line. Its topographic position, with an average elevation of 25-35 feet MSL, at the bottom of the drainage path on the coastline, and downslope from upland areas of the Island and Tiverton, ensures that the rail right-of-way receives stormwater runoff.

Drainage ditches or swales are an integral component of the railroad bed drainage design and occur almost continuously along the rail right-of-way. Drainage structures installed when the railroad was built, however, were not designed to handle the increased runoff resulting from development that occurred over the next century, and especially the commercial and residential development within the past two decades.

In many areas, the lack of maintenance and the need for redesigning drainage structures and upgrading capacity has caused water to accumulate and pool along the track and ditches rather than be directed through and out of the rail corridor. The standing water has caused the development of some wetland conditions. Many of these areas along the corridor would be classified by the RIDEM as nonbiological wetlands, including Areas Subject to Storm Flowage (ASSF) and Areas Subject to Flooding (ASF). Even upgrades of the drainage structures, which may have been installed many decades ago, may no longer be adequate to handle the increased stormwater because of the increase in impervious surfaces from subsequent development. Cleaning of culverts and ditches, removal of vegetation, resizing and installing some new drainage structures, and regular maintenance would result in removal of the wet conditions and poor drainage which currently pervades much of the rail corridor.

Approximately 78 culverts or bridges convey water across, from, and through the right-of-way for the project study area. In many locations, the drainage structures have failed, either because of age or because of a need for new design and construction to accommodate increased urban runoff volumes from adjacent and nearby impervious surfaces in more recent development. As a result, a walk over the railroad line, would, to a casual observer, give the impression of a large amount of linear wetlands along and within the right-of-way corridor. In point of fact, the standing water in these areas would be directed out of the rail corridor if the drainage structures were adequately handling the increased runoff from adjacent areas.

There are a number of locations where offsite drainage water is being channeled or dumped onto the corridor, and drainage patterns and structures upslope from the rail now direct large amounts of storm water to the rail corridor. The result is that some drainage structures within the right-of-way are now silted in, buried or

overwhelmed. In many areas, particularly where the rail corridor goes through cut sections where the land on both sides is much higher than the railroad, water sits in ditches at the toe of slope of the railbed. The standing water in these drainage swales provides little functional value as a biological wetland and may serve as breeding areas for disease-carrying mosquitoes.

It is the recommendation of this study that the RIDOT give consideration for developing a drainage inventory and improvement plan for the rail right-of-way, even if the no-build option is selected. Such a plan will help to protect the existing railroad bed as an asset. The plan would identify locations where structures need to be resized and replaced, silted ditches, prevent unauthorized discharge of drainage from adjacent and nearby properties, and plan for regular maintenance of the rail right-of-way.

4.1.2 Aquidneck Island Wetlands Inventory

The Aquidneck Island segment of the rail line study area extends approximately 12 ¼ miles from the Gateway Center in the City of Newport to the Sakonnet Bridge in Portsmouth, corresponding with mileposts 0.00 to 12.26 respectively. Twenty-seven wetland areas have been identified along this segment, which includes freshwater, and coastal wetlands that are within or adjacent to the rail corridor, as well as some stream-associated wetlands. The railroad currently crosses 14 wetlands or streams on Aquidneck Island; of these, five crossings occur over major wetland complexes. The locations of these crossings are depicted on Figures 3-PT through 14-N. Impacts may occur to these sensitive environments from either bike path or new rail service alternatives.

Major Wetland Systems

Among the most valuable wetlands intersecting the rail right-of-way, is Boyd's Marsh (vicinity of milepost 11.5), where the rail corridor goes through the middle of a major saltmarsh and a perennial stream, which discharges, to the Bay. Much of the existing rail is on fill, which slopes steeply to the salt marsh. This area, which was formerly a salt pond and marsh, called Town Pond, is also in the early stages of a joint federal/state and local, major restoration project that will remove much of the invasive Phragmites reed which currently dominates the area. (Personal communication, Tom Ardito, RIDEM, Office of Water Resources, 1/2002) Restoration plans include regrading areas of the marsh to provide deep and shallow saltmarsh habitats and to improve tidal flushing, enhancing the marine and estuarine functional values of the area.

Other major wetlands that intersect the rail corridor on Aquidneck Island include:

- A large freshwater swamp and saltmarsh complex immediately adjacent to the rail corridor in the vicinity of Porter Lane and Mitchell Road just south of the Mt. Hope Bridge;
- An unnamed stream and freshwater wetland crossing just north of Willow Lane and south of Terminal Road;
- An unnamed stream and freshwater wetland crossing just south of the Kaiser Complex on Willow Lane;
- A major freshwater swamp/river (Barker Brook) complex, tidally connected and associated with a saltmarsh area just north of the Portsmouth Abbey Properties;
- An unnamed perennial stream associated with a freshwater swamp, Melville Pond, and tidally connected just north and adjacent to the Melville Marina Complex;
- A moderate sized unnamed stream and freshwater wetland area, vicinity of the tracks, just south of the Melville Marina, which discharges into a saltmarsh complex;
- Stream crossings at Norman's and Gomes Brook locations, tidally connected and associated with freshwater swamps along Burma Road, and
- A large unnamed stream crossing in Newport behind commercial development on J.T. Connell Highway and adjacent to Multi-family housing complex at milepost 1.15. This stream accepts large amounts of urban run-off and discharges to estuarine habitats between the mainland and the Navy's Coasters Harbor Island.

It should be noted that all the wetland and stream crossings identified above already have the railroad in place. There will be no new rail alignment in these sensitive wetland habitats.

Aquidneck Island Coastal Habitats and Features

In some locations the existing rail right-of-way is only fifteen feet or so away from coastal bluffs and marsh areas. For most of its alignment on Aquidneck Island, the rail is within the 200-foot contiguous area landward of any coastal feature which is regulated by the Rhode Island Coastal Resources Management Council (CRMC). The wetlands inventory and mapping tasks conducted for this study have identified all sensitive coastal and freshwater habitats. Rhode Island Freshwater Wetland Rule revisions now give the CRMC jurisdiction of freshwater wetland alterations and permitting in the vicinity of the coast. The jurisdictional line for CRMC freshwater wetlands permitting is the railroad track for all of the western shore of Aquidneck Island and Tiverton. The CRMC now has regulatory review authority for all freshwater and coastal wetlands permitting needed for implementation of any new rail service alternatives or bike path construction.

4.1.3 Tiverton Wetlands Inventory

The Tiverton rail corridor segment presents similar constraints and conditions to those found in the Aquidneck Rail segment. Tiverton, however, lacks many of the coastal marsh complexes and the topography is generally more steep. The Tiverton ROW is also only one-quarter of the length (approximately 3 miles) of the segment for Aquidneck Island.

Drainage characteristics of the rail corridor are similar to that mentioned previously, causing some wet conditions along parts of the rail corridor, particularly for the rail section just north of Route 24 and to the west of Lewis Street, where the corridor alignment goes through a steep cut area and there was a fair amount of standing water. Lack of maintenance to drainage structures in this area may be resulting in creation of wetland areas along the railbed. Some of the water there may be attributed to runoff from surrounding development.

The rail corridor segment in Tiverton has a total of ten wetlands, mostly small and stream associated. The wetland locations are depicted on Figures 1-T to 3-PT. An important characteristic of the rail in Tiverton is the proximity to the coastline. Approximately 45% of the rail corridor (about 1.4 miles) lies within 100-feet of the coastal shoreline. This condition requires that any construction activities or facility siting be very carefully planned to avoid potential impacts.

The most significant wetlands that cross the rail corridor in Tiverton are two stream and associated wooded swamp freshwater areas. The southernmost stream is in the vicinity of Bismark Avenue and abuts new residential development occurring there. A wooded swamp and small intermittent steam is located in the vicinity of milepost 15. The wooded swamp in this area extends to the east of the rail corridor and it appears from clearing and grading activities, that a major subdivision will be developed in the vicinity.

Other freshwater wetlands on the Tiverton segment include a small wooded swamp and associated stream to the north of Lepes Road and another unnamed stream with a larger wooded swamp at Judson Street at the edge of a residential neighborhood.

Tiverton Coastal Wetlands, Habitats and Features

The coastline is within 100 feet of the rail corridor in Tiverton for nearly half of its 3-mile length. For most of the alignment, the rail tracks follow the top of the coastal bluff which is a regulated coastal or shoreline feature by the CRMC. Cobble and gravel beach habitat predominates the coastline with freshwater streams forming a hydrological link between the freshwater wetlands and the coastline.

Coastal marsh habitats are absent from the vicinity of the Tiverton rail corridor. However, there is a man-made beach and sand spit area in the vicinity of the proposed Starwood Development to the north of Carey

Lane. The deposits are reportedly spoil materials from early (prior to Starwood) dredge operations in the area. Vegetation has established itself on the bit of land as well as some small freshwater pond and marsh areas. In this area, a pond located to the south is tidally influenced and has saltmarsh vegetation present. The whole dredge spoil area appears to be functioning as type of a barrier beach habitat, but without the pronounced dune forefronts typical of most such beach areas. It is the only landform along the rail corridor that offers a different type of habitat from the cobble and gravel beaches. The sand beach area and the associated ponds are located over 100 feet to the east, from the existing rail corridor. This area would not be impacted by new rail service, but does present an area of concern for bike path alignment and construction. Should a train station be constructed in the vicinity, careful planning will be required to avoid and minimize potential impacts.

4.1.4 Wetland Permitting Considerations

Development of any of the rail service alternatives, other than the "no-build," will create the potential for wetland impacts. Though careful attention was given to wetland impact avoidance when determining station and side and passing rail locations, complete avoidance was not practicable due to space constraints and property limits. Likewise with the bike path alignment, some impacts, due to the necessary crossings, also present a potential for wetland impact. Permits will be needed to develop the bike path or any of the rail alternatives. The CRMC has authority to review coastal alterations, and freshwater alterations. The CRMC will also review applications under Section 404 of the clean Water Act as a Programmatic General Permit.

Rail Replacement Construction Related Impact Potential

Development of rail service alternatives will involve removal of the existing rail and ties for the length of the improvements, the addition of a thin layer of new bedding material onto the existing rail bed and installation of new, welded, seamless rail and ties. As the location of most of the rail corridor falls within 200 feet of various coastal features regulated by the CRMC, Council Assent will be required for the proposed construction.

The rail corridor falls within 200 feet of coastal features and in some locations within 25 feet of coastal bluffs, headlands and marshes (types of coastal features). The CRMC recognizes six water use category types of areas under their jurisdiction. There are five types adjacent to the project area, which are listed below.

Table 4-1
rail corridor CRMC Type Waters

CRMC Type	Location Along rail corridor
Type 1 Conservation Areas	Tidal stream crossing vicinity of Coasters Harbor, Newport.
Type 2 Low Intensity Boating	Boyd's Marsh area through to Bristol Ferry Terminal (Milepost 12 - Milepost 11).
Type 3 High Intensity Boating	Sakonnet Bridge Area
Type 4 Multipurpose waters	From Bristol Ferry Terminal south to Navy breakwater at NUWC Facility on Burma Road.
Type 6 Industrial Waterfronts and Commercial Navigation Channels	NUWC Facility south to Coddington Cove, Ranger Road vicinity.

Each CRMC Water Use Type has certain requirements and limitations under the Regulations, for alterations affecting coastal features. Proposed station locations are set back far enough from coastal features to not fall within CRMC jurisdiction, with the exception of the Starwood Station in Tiverton which is within 200 feet of a coastal wetland.

Expansion of rail service to provide shuttle or commuter rail service will entail replacement or major reconstruction at nine wetland/stream crossing bridge locations on Aquidneck Island. Transystems, Inc. of the Project Team has identified the following bridges will in all likelihood require improvements:

1. Boyd's Marsh Bridge - vicinity milepost 11.5
2. Bridge vicinity of Weyerhaeuser Road - milepost 9.6
3. Bridge vicinity south of Willow Lane - milepost 9.0
4. Barker Brook Bridge - milepost 8.7
5. Bridge north of Melville - milepost 7.6
6. Bridge vicinity Weaver Cove Boat Launch - milepost 6.15
7. Bridge vicinity of Carr Recreation area - milepost 5.7
8. Bridge vicinity Green Lane - milepost 5.45
9. Bridge vicinity of commercial development, back of J.T. Connell Rd. - milepost 1.15

Construction within these areas will require a CRMC freshwater wetlands permit, though some of the bridge improvement activities may be exempt under Rule 2.03.

Replacement of the rail track and ties as well as repair and rehabilitation of bridges over tidally influenced streams falls within a Category B Assent under Regulation 300.13, which requires a public comment period. This is due to the fact that the rail replacement does not appear to fall under routine maintenance as provided under Regulation 300.14, and that the construction activities would occur in many areas along the top of coastal bluffs and cliffs, as well as in very close proximity to coastal beaches.

The CRMC has jurisdiction over freshwater wetlands permitting for the coastal area including the rail corridor. Bridge repair and rehabilitation will require review by CRMC under this authority. Significant changes in drainage structures that discharge to wetlands or other water bodies will require freshwater wetlands review and permit application, as well as Water Quality Certification. The proposed Melville Station location footprint, as depicted, shows a minor edge impact (potential fill) to a shrub swamp in the area, as well as an area subject to storm flowage, also regulated by the CRMC under their freshwater wetlands authority.

Bike Path Permit Considerations

The bike path alignment will require a Category B Council Assent Review because of the extent and the location along the top of coastal bluffs, and alongside and through coastal marshes and beaches. The bike path is proposed to cross saltmarsh, a tidal inlet, and beach areas at Boyd's Marsh and in the vicinity of the proposed Starwood development in Tiverton. Installation of recreation facilities is prohibited in some of the coastal areas proposed, however, the project may be permitted under Special Exception, under Section 130.A.1. as the bike path facility would comply with the provision that it, "Provides access to the shore for broad segments of the public." Careful attention needs to be made to ensure that fill impacts are minimized to the greatest extent possible, and they may require development of a compensation and mitigation plan.

The Boyd's Marsh Area is owned by the State (publicly owned), and a section of the beach is reportedly designated by the State of Rhode Island, Dept of Environmental Management as a wildlife refuge (Personal communication with Tom Ardito). The bike path is proposed to cross the Marsh, as such this may qualify as an impact to a Section 4(f) property under the US DOT Act of 1966. This will in all likelihood require a Section 4 (f) Evaluation should this bike path alignment be pursued.

Some of the bike path alignment, where it follows within the existing rail corridor, will require crossing freshwater wetlands and stream channels and valleys. Due to the narrowness of the rail bed in some locations, particularly at the Barkers Brook crossing, in the vicinity of the Mussel Shoals Area south of the Mt. Hope Bridge, and the wetland north of Willow Lane, will require some wetlands fill and bridge structures to ensure that the bike path is buffered from the rail track.

4.1.5 Flood Hazard Zones

Flood Plain Areas are protected by Executive Order 11988 and fall under the jurisdiction of the RIDEM and the CRMC Regulations in Rhode Island. Figures 1-T through 14-N depict the 500 year, 100-year flood hazard areas and wave velocity (VE) zones as identified from detailed flood insurance studies mapping available from the State of Rhode Island RIGIS data. The 100-year floodplains have been identified in the Flood Insurance Study by detailed methods. The VE Zone is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. As can be seen, much of the existing rail corridor lies within 100-year flood zones as it has since it was first constructed in the 1860's. The 100 year flood elevation ranges from about 24 - 30 feet MSL. Much of the rail ROW on Aquidneck Island and in Tiverton falls within 100 year flood limits. Design and construction activities related to the bike path and bridge repair or replacement for the rail service will need to take flood hazard areas into consideration.

Proposed fill and construction within Flood Hazard areas will require review and approval by the CRMC. Areas where new fill is placed within a flood plain may require compensation of storage capacity.

Aquidneck Island Flood Hazard Zones

The 100-year flood zone or VE zone covers approximately 85% of the rail corridor in Newport with the exception of the segment shown on Newport Figure 5-P, in the vicinity of Navy Gate 4, where the flood zone extends slightly from the Middletown/Newport, boundary. Figures 3-PT through 14-N present flood hazard areas for the Aquidneck Island ROW.

In Middletown, the 100-year flood zones cover nearly 70% of the rail corridor from the Newport Line through to McAllister Point off Burma Road. From McAllister Point to the Portsmouth Town Line, flood zones comprise about 5 % of the rail corridor.

The Portsmouth Segment begins just south of the Carr Recreation Area on Burma Road. A 100-year floodplain area extends along the rail corridor and is associated with Norman's Brook, a perennial stream. The flood zone extends for about 700 feet on either side of the brook. Just north of Carr Recreation Area, at the Weaver Cove Boat Launch facility, a smaller floodplain extends approximately 150 feet on either side of Lawton Brook, another perennial stream. Nearly 90% of the rail corridor lies within 100-year floodplains extending from the Weaver Cove Boat Launch access road on Burma Road to milepost 8.0, about ¼ mile south of Cory's Lane and Portsmouth Abbey Properties. From Cory's Lane north to the Mt Hope Bridge, floodplains along the rail corridor are confined to the banks of Barker's Brook (milepost 8.7) and an unnamed perennial stream north of Willow Lane which feeds into the freshwater pond near the Mt. Hope Station location.

Flood zones overlay nearly 100% of the rail corridor from the east of the Mt. Hope Bridge area at the end of Bay View Avenue to the Sakonnet River Bridge. About 85 % of the area is 100-year floodplain, and the remainder 500-year floodplain. The latter area is located primarily in the vicinity of the Montaup Country Club buildings.

Tiverton Flood Hazard Zones

Flood zones along the Tiverton rail corridor Segment are depicted on Figures 1-T through 3-PT. The Sakonnet River Rail Bridge causeway falls within the 100-year floodplain, extending from the River to Riverside Drive. Topography limits floodplains to the coast and away from the rail corridor from Evans Avenue to Carey Lane. Flood hazard zones cover much of the rail corridor in Tiverton from Carey's Lane northward.

4.2 Wildlife and Threatened and Endangered Species

Habitats that support wildlife along the rail corridor include hardwood forest, old field-shrub successional, early successional old field (herbaceous plants dominate), wooded and shrub swamps, fresh and saltwater marshes, tidal flats and beaches, and streams and rivers. Suburban areas as presented by the residential developments along the corridor also provide habitats for animal species. Common animal species located along the corridor include deer, fox, raccoon, possum, quail, pheasant, ruffed grouse, squirrels, cotton tail rabbit, voles, mice and shrews, waterfowl and various migratory songbirds.

The Rhode Island Natural Heritage Program of the RIDEM was contacted to determine if any endangered or threatened species are present along the rail corridor which could possibly be impacted by development of rail alternatives or the bike path. Mr. Richard Enser of the Program reported that there are no endangered or threatened species along the study area. He did, however, recommend that should the project proceed to an implementation stage, that his office be contacted again as their information may change in the future.

4.3 Water Quality

Potential for water quality impacts comes primarily from construction activities of rail alternatives and a bike path facility. A no-build action would present no new threat-potential to existing coastal or freshwater surface or groundwater water quality. Development of new rail service will require that some bridges are repaired and some culverts replaced, as well as regrading selected areas of the ROW to improve drainage. Water quality impacts may result from potential fuel spills along the ROW, though this event is unlikely. Appropriate best management practices (BMP) can prevent degradation of water quality in streams and other water bodies which intersect the rail row. Staging areas for rail and tie replacement can be sited to minimize threats to water quality as well as installation of safeguards, and strict adherence to regulatory requirements regarding fuel storage and vehicle-fueling areas.

The CRMC and RIDEM will require that bmp for erosion and sediment control be installed and maintained for construction activities in proximity to their jurisdictional limits. Designs of facilities will also be reviewed to ensure that appropriate BMPs for stormwater are incorporated to avoid degradation of existing water quality.

The Narragansett Bay area, containing the rail ROW Corridor, is located within the Narragansett Basin, a synclinal feature stretching 55 miles northward toward Hanover, Massachusetts. The bedrock formations in Rhode Island are almost completely mantled by deposits of outwash and glacial till. Bedrock and consolidated rocks within the Subject Property can be categorized into crystalline (igneous and metamorphic) and sedimentary rocks. Two distinct formations can be observed within the Subject Property; older igneous granitic rock of several ages and compositions in Tiverton, and the Rhode Island Formation, a suite of Pennsylvanian-age sedimentary rocks south of the bridge and throughout the remainder of the ROW and the Narragansett Bay area. (*Soil Survey of Rhode Island,* 1981)

The granitic rocks found in the northern reaches of the rail ROW include the pre-Pennsylvanian Bulgarmarch granite, metacom granite gneiss, and porphyritic granite, as well as slate and quartzite. These rocks also become exposed to the south in Newport Neck. The Rhode Island Formation has an approximate thickness of 10,000 feet and its composition can be described as fine to coarse conglomerate, sandstone, graywache, arkose, shale, and meta-anthracite. (CDM, *Final SIP Report, Melville North Area,* 1995)

4.3.1 Groundwater

The ROW is contained within the Narragansett Bay Basin, the most extensive basin in Rhode Island. The basin includes the system of waterways that discharge into the Atlantic Ocean between Point Judith in Narragansett and Sakonnet Point in Little Compton. The Narragansett Bay Basin also contains the watershed tributaries to Narragansett Bay as well as the small waterways that flow into the Atlantic Ocean from Sakonnet Point east to the Massachusetts-Rhode Island state line in Tiverton, at the northernmost extent of the

Subject Property. In the vicinity of the ROW, groundwater is generally flowing to the west, toward Narragansett Bay.

Groundwater in the vicinity of the corridor is classified as mainly as GA by Rhode Island Geographical Information Systems ("RIGIS"), with a small area of GB classification in the vicinity of Melville and a more extensive area of GB classification extending from the Navy piers south past Newport Gateway and the southern terminus of the ROW. According to RIDEM, class GA groundwater consists of groundwater resources that are designated to be suitable for public or private drinking water use without treatment. Groundwater classified as GB consists of groundwater resources, which have been designated not suitable for public or private drinking water use. Groundwater located beneath highly urbanized areas with dense concentrations of industrial and commercial activity, permanent waste disposal areas, and areas immediately surrounding the permanent waste disposal area may be classified as GB. No Community and/or Non-Community Wellhead protection areas are located in the immediate vicinity of the rail ROW.

4.3.2 Surface Water

The nearest surface water bodies to the rail ROW consist of coastal portions of eastern Narragansett Bay, the Mount Hope Bay, and the upper reaches of the Sakonnet River near the Sakonnet swing bridge. The Narragansett Bay is rated use Class SA, which is presumed to be suitable for shellfish harvesting for direct human consumption, primary and secondary contact recreational activities, and fish and wildlife habitat. Class SA waters are also considered suitable for aquacultural uses, navigation, and industrial cooling with good aesthetic value. The Mount Hope Bay is rated use Classes SA and SB in the vicinity of the subject property. Waters immediately north of the Sakonnet swing bridge are rated use Class SB, while waters to the west between Bristol and Portsmouth are rated use Class SA. Class SB waters are presumed to be suitable for primary and secondary contact recreational activities; shellfish harvesting for controlled relay and depuration; and fish and wildlife habitat. Class SB waters are also considered suitable for aquacultural uses, navigation, and industrial cooling with good aesthetic value. The upper reaches of the Sakonnet River near the Sakonnet swing bridge are rated use Class SB as well.

Surface water quality classification of the freshwater streams and ponds within and adjacent to the rail ROW is considered to be "A," or "B." There is some impaired freshwater quality to the stream that discharges from Melville Pond into coastal waters at the Boat Basin there. This is due in part to the presence of contaminated sites (Navy Tank Farms and the N. Melville Landfill) currently under study for site remediation and restoration.

Additionally, numerous small coastal inlets are classified along the coast of Portsmouth, Middletown, and Newport. These inlet waters are rated as use Class SB/SB1/SB{a}. Class SB1 waters are presumed to be suitable for primary and secondary contact recreational activities and fish and wildlife habitat. They are suitable for aquacultural uses, navigation, and industrial cooling with good aesthetic value. However, primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges. For waters rated SB{a}, {a} indicates a partial use designation due to impacts from CSOs. (RIDEM, *Water Quality Regulations,* 1997)

4.4 Traffic

Currently available traffic and transportation information is based on counts presented as "average day" demand. On an average weekday in 1999, there were approximately 641,000 two way trips on Aquidneck Island. About 4.6% used buses, ferries, and other forms of public transportation. The remaining 95.4% of the trips used cars or trucks. A little less than half the trips were for business purposes including commuting to work. A survey that is being currently being conducted by the Aquidneck Island Planning Commission will update the information. Results will be available at the end of 2002.

The proposed rail service is designed to attract visitors and commuters who would otherwise drive from the north of the Island to Newport and points in-between. On an average weekday in 1999, a total of

approximately 18,700 vehicles crossed the Mt. Hope Bridge on/off the Island and 40,700 crossed the Sakonnet River Highway Bridge. These 59,400 vehicles and their occupants are the target market for the on-island and commuter shuttles services analyzed in this report. These numbers are a blended average of year-round demand including weekdays, weekends, and peak days. A more detailed breakdown of demand will be available after the AIPC study described above has been completed.

During high season weekends, single car trains whose combined ridership has been forecast at approximately 900 boardings, would offer 1% +/- reductions in roadway traffic on the two northern bridges, depending on actual ridership, persons/car, and how much of the new transit capacity is used. Typically, new passenger rail services, especially those catering to visitors, gradually become accepted and performance often exceeds forecast demand. The Burlington-Shelburne, VT, and Cape May, NJ, lines are examples of this pattern.

During the past decade, Rhode Island tourist demand has grown approximately 5% per year. The 5,200 seat daily capacity of the minimum equipment needed to operate passenger rail service is equivalent to approximately 2,100 weekday vehicle trips. This would represent up to a 4%+/- reduction in vehicle traffic across the bridges. Since the proposed facilities allow the operation of two-car trains, reductions of crossings on the northern bridges could reach 8% before additional infrastructure or equipment are needed.

Overall, operation of the passenger rail shuttles would have a small, but noticeable positive impact on the Island's traffic congestion.

4.5 Phase I Environmental Site Assessment

At the request of Rhode Island Department of Transportation ("RIDOT"), the Louis Berger Group, Inc., ("Berger") has prepared a Phase 1 Environmental Site Assessment ("ESA") of the Newport Secondary Corridor, Conrail Line, which consists of the railroad property within the right-of-way ("ROW") lines located in the communities of Tiverton, Portsmouth, Middletown, and Newport, Rhode Island ("rail corridor"). Within the rail corridor, a total of six train stations ("Stations") are proposed which include Tiverton Station (milepost 13.66, Tiverton), Anthony Road Station (milepost 12.36, Portsmouth), Mount Hope Station (milepost 9.96, Portsmouth), Melville Station (milepost 7.13, Portsmouth), Community College of Rhode Island ("CCRI") Station (milepost 1.72, Newport), and Newport Station (milepost 0.06, Newport). This report includes a site inspection, a historical characterization, and a regulatory file review of the rail corridor, stations, and Subject Parcels[1].

The rail corridor is currently owned by RIDOT, who is leasing the rail corridor to two firms to operate tourist and dinner trains. The rail corridor is approximately 16 miles in length from mileposts 0.0, at Newport, to 15.8 at the Rhode Island and Massachusetts State border, in Tiverton. On Aquidneck Island, consisting of the communities of Newport, Middletown, and Portsmouth, the rail corridor is situated along the western coast with a north/south orientation. In Tiverton, the rail corridor is also situated along the coast with a north/south orientation. The track is typically located in the center of the ROW with a centerline located at the center of the distance between the rails.

The purpose of the ESA is to identify the presence of any "Recognized Environmental Conditions" ("REC") as defined by American Society for Testing and Materials ("ASTM") Standard Practice E-1527, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process,* with respect to the rail corridor. Berger conducted visual site inspections and RIDEM file review[2].

[1] Properties located adjacent or in close proximity to the Rail Corridor and/or Stations.

[2] The file review was based on the database search conducted by Vistainfo of San Diego, California, which search the Rail Corridor and areas within a 400-foot offsets from the centerline of the track.

The following Subject Parcels and areas of the rail corridor, from mileposts 15.6 to 0.0, are identified as RECs (see Figures 1-T through 14-N):

1. **Rail Corridor at milepost 2.2**
   Stained grass within the rail corridor below the aboveground piping system associated with the Boiler Plant (Building No. 7) of the Navy facility was observed, which could be a result of pipe leaks.

2. **Derektor Shipyard, Coddington Cove, Middletown, RI (milepost 2.4)**
   Based on the upgradient location, proximity of the shipyard, and contamination of: BTEX compounds, solvents, waste oil, spent sand blast grit, abandoned 55-gallon drums, undocumented underground storage tanks ("USTs") and ASTs, and other waste solids and liquids, this site may pose a threat to the rail corridor.

3. **Derektor Shipyard, Coddington Cove, Middletown, RI (milepost 2.4)**
   Derektor Shipyard underwent a PCB cleanup with the work described in the closure report. Additional releases of oil and/or hazardous materials ("OHM"), gasoline, were uncovered during the cleanup work, which is believed to be from the upgradient gas station.

4. **Naval Undersea Warfare Center ("NUWC") Disposal Area, Middletown, RI (milepost 3.4)**
   Based on the upgradient location, proximity of the NUWC Disposal Area, and the petroleum contamination currently present on this site but that no remediation is currently taking place, this site may pose a threat to the rail corridor.

5. **McAllister Point Landfill, Middletown, RI (milepost 3.8)**
   Based on the proximity of the Landfill area and contamination of BTEX compounds, acids, waste oil, PCBs, pesticides, carcinogenic Polynuclear Aromatic Hydrocarbons ("PAHs"), and metals. this site may pose a threat to the rail corridor.

6. **U.S. Navy Fuel Line, Middletown & Portsmouth, RI (mileposts 4.1 to 7.1)**
   A main fuel pipeline, which connects all the tank farms, is situated on the east side and along Burma Road. The pipeline crosses Burma Road and Railroad tracks to refueling points along the western coast of Aquidneck Island. There was evidence that pipeline have leakage.

7. **Tank Farms 4 & 5, Middletown & Portsmouth, RI (mileposts 4.1 & 5.6)**
   Although the USTs were demolished at Tank Farms 4 and 5, no remedial actions were implemented to address the bedrock fuel leakage.

8. **Rail Corridor adjacent to Green Lane (milepost 4.5, Middletown)**
   Berger observed a utility underground vault and aboveground structure with an AST. The utility housing was located within the rail corridor, or approximately 20 feet east of the rails.

9. **Midway Pump House (milepost 4.67, Middletown)**
   Free oil product was uncovered at the Midway pump house, located east of the rail corridor. Transformers were observed by Mr. Kulpa to be south and adjacent to the Midway pump house.

10. **Tank Farms 1, 2, & 3, Portsmouth, RI (mileposts 6.0, 7.0, and 7.1)**
    Tank Farms 1, 2, and 3 are functioning with stored materials ranging from heavy oil to jet fuel. A comprehensive site characterization at the three tank farms has not been initiated. According to Mr. Kulpa releases of OHM in these Tank Farms are most likely. However, on August 1, 2002, Mr. Kulpa stated that these tanks had not been used for approximately 3 years.

11. **Melville North Landfill, Portsmouth, RI (milepost 6.8)**[3]
    Based on the proximity of the Landfill area and contamination of benzene, toluene, ethyl benzene, and xylene ("BTEX") compounds, acids, waste oil, polychlorinated biphenyls ("PCBs"), pesticides, and metals. this site may pose a threat to the rail corridor.

12. **Melville North Landfill, sludge drying bed, Portsmouth, RI (milepost 6.8)**[3]
    Based on the proximity of the Sludge Drying Bed area and waste oil contamination, this site may pose a threat to the rail corridor.

13. **Melville North Landfill, Structure 214, Portsmouth, RI (milepost 6.9)** [3]
    Based on the proximity of the Structure 214, reported waste oil contamination, and no information on remediation, this site may pose a threat to the rail corridor.

14. **Rail Corridor at the dinner train staging area in Melville (milepost 7.1)**
    Berger observed junk metal parts, batteries, electrical equipment parts, used oil drums, and new oil containers. Also, Berger observed a concrete utility vault which houses control valves for the oil tanks located up-gradient. Berger did not gain access to the vault for inspection. However, the vault should be thoroughly inspected for oil leakage.

15. **Rail Corridor at milepost 7.1**
    In Melville, Berger observed solid waste in the southwest corner of the intersection of Stringham Road, which consisted of an abandoned small volume gasoline container, an empty 55-gallon drum, a small-volume, rusty propane tank, a plastic barrel on its side, and general rubbish.

16. **Rail Corridor at mileposts 7.4 and 7.1**
    Berger observed commercial solid waste, oil sheen, unknown orange powdery substance, and turbid standing water in the ditch area, in the vicinity of Melville.

17. **Rail Corridor at the intersection of Willow Lane (milepost 9.3)**
    Berger observed tall silos next to an industrial building formerly known as Keiser and adjacent to the west side of the rail corridor. No signs of oil or hazardous materials ("OHM") spills were observed around the silo.

18. **Rail Corridor at milepost 9.84**
    The area of concern is located just south of the Mount Hope Maritime Terminal, Berger observed abandoned rail cars on the west side of the rails.

19. **Rail Corridor at milepost 10.4 (Portsmouth)**
    Berger observed a dark stain in between the rails, which is typical throughout the rail corridor.

20. **Rail Corridor at milepost 13.6**
    Berger was prevented from proceeding south due to very dense vegetation growth. The inspection was reestablished at milepost 13.2; therefore, the segment of the rail corridor between mileposts 13.2 and 13.6 was not inspected.

21. **Rail Corridor adjacent to Carey Lane intersection (milepost 13.8)**

[3] On August 1, 2002, Mr. Kulpa state that the report submitted by the Navy regarding the Melville North Landfill (Parcels 11, 12, and 13) had not yet been accepted to RIDEM. Therefore, this report reflects the most recent data on record.

Berger observed a large open area (approximately 80 acres) adjacent to the east side of the rail corridor. In comparison to surrounding undeveloped areas, no major vegetative or plant growth was observed in the open area. According to the United States Geological Survey ("USGS") Quadrangle map, the area was occupied by a tank farm with aboveground storage tanks ("ASTs").

22. Rail Corridor adjacent to the corner of Judson Street and Bay Street (milepost 15.4, Tiverton)

Berger observed household solid waste on both sides of the rail corridor, which consisted of wood furniture, a refrigerator, plastic sheeting, and containers.

Berger recommends that, to evaluate potential exposure to pedestrians and bicyclists, a Phase II Environmental Site Assessment be conducted to evaluate surface and subsurface soil, which will consist of sampling for PAHs, VOCs, TPH, PCBs, DDT, and metals at Melville North Landfill, Melville Sludge Drying area, Melville Structure 214, McAllister Landfill, and Derektor Shipyard. In addition, samples should be taken at Rail Corridor adjacent to Tank Farms 1 through 5, main fuel line crossing points, and Midway pump house for analyses of VOCs, TPH, and SVOCs. Inspection for OHM releases at the concrete vault, dinner train staging area in Melville (milepost 7.1), should be conducted, Berger did not gain access to the vault for inspection. Other concrete vaults housing fuel valves should also be thoroughly inspected for OHM releases.

4.5.1 Background

At the request of Rhode Island Department of Transportation ("RIDOT"), the Louis Berger Group, Inc., ("Berger") has prepared a Phase 1 Environmental Site Assessment ("ESA") of the Newport Secondary Corridor, Conrail Line, which consists of the railroad property within the right-of-way ("ROW") lines located in the communities of Tiverton, Portsmouth, Middletown, and Newport, Rhode Island ("rail corridor"). Within the rail corridor, a total of six train stations ("Stations") are proposed which include Tiverton Station (milepost 13.8, Tiverton), Anthony Road Station (milepost 12.7, Portsmouth), Mount Hope Station (milepost 10.0, Portsmouth), Melville Station (milepost 7.1, Portsmouth), Community College of Rhode Island ("CCRI") Station (milepost 1.72, Newport), and Newport Station (milepost 0.0, Newport). This report includes a site inspection, a historical characterization, and a regulatory file review of the rail corridor, Stations, and Subject Parcels[4].

4.5.1.1 Rail Corridor

The rail corridor is currently owned by the Rhode Island Department of Transportation (RIDOT), which is leasing the rail corridor to two firms to operate tourist and dinner trains. The rail corridor is approximately 16 miles in length from mileposts 0.0, at Newport, to 15.8 at the Rhode Island and Massachusetts state border, in Tiverton, RI. On Aquidneck Island, consisting of the towns of Newport, Middletown, and Portsmouth, the rail corridor is situated along the western coast with a north/south orientation. In Tiverton, the rail corridor is also situated along the coast with a north/south orientation. The track is typically located in the center of the ROW with a centerline located at the center of the rails.

Topography

The rail corridor is generally elevated between 25 and 35 feet above mean sea level; however, the grade is lower near the Coddington Cove section of rail. Additionally, the rail is situated in close proximity to the coast and is within 50 feet of the shoreline west of Kings Grant, south of the Portsmouth boat landing and south of Greene Lane. This shoreline proximity limits use of the corridor on the west side of the track. The rail corridor is also located within the 100-year-flood zone in several areas. (Edwards and Kelcey, *Final West Side Transportation Guide Plan*, 2001)

[4] Properties located adjacent or in close proximity to the Rail Corridor and/or Stations.

4.5.1.2 Stations

The stations are proposed to be located along the corridor, at Mileposts 0 (Newport), 1.7 (CCRI), 7.1 (Melville), 10.0 (Mt. Hope), 12.4 (Anthony Road), and 13.7 (Tiverton) as previously discussed in Section 2.5.2 and presented in Figures 3-11 through 3-25.

4.5.1.3 Summary

The objectives of project include preservation of the underutilized rail right-of-way for future transportation use, determination of feasible interim uses to serve the transportation needs of Aquidneck Island, and provision of information to assist local decision-makers in land use decisions on the west side of the Aquidneck Island. The evaluation of the transportation needs and associated investment for Aquidneck Island requires strategies for options of rail upgrades with rail stations and a potential bike path location within or along the rail corridor. Properties located adjacent and/or within close proximity to the corridor are defined as "Subject Parcels." Properties identified as having recognized environmental conditions[5] ("RECs") including a release or threat of a release of oil and/or hazardous materials ("OHM") which may affect the rail right-of-way are defined as "properties of concern."

The ESA was performed to identify RECs with respect to the corridor based on a review of available environmental records and evidence of a release or a threat of a release of OHM that may affect the rail right-of-way. The ESA included records a visual site inspection, review of site history, and a review of federal and state of the rail corridor and Parcels.

4.5.2 Soils

Soil deposits within the Aquidneck Rail passage vary throughout the length of the corridor and Station locations. Beginning at the northernmost portion of the rail in Tiverton, dominant soil series include interspersed UD (Udorthents-Urban land complex), NeC (Newport silt loam, 8 to 15 percent slopes), and HnC (Hinckley-Enfield complex, rolling). Near the Sakonnet swing bridge, the series is classified as UD. This UD classification continues on the Portsmouth side of the swing bridge as well and changes to PmB (Pittstown silt loam, 3 to 8 percent slopes) in the vicinity of the Mount Hope Bridge. The section of the rail line from immediately south of the Mount Hope Bridge through Portsmouth to Melville varies widely in soil series classification and includes small areas of MmA (Merrimac sandy loam, 0 to 3 percent slopes), Wa (Walpole sandy loam), EfB (Enfield silt loam, 3 to 8 percent slopes), Sb (Scarboro mucky sandy loam), and concludes with an extended section of NeB (Newport silt loam, 3 to 8 percent slopes) north of Melville. In Melville, the soil classification changes to UD, extending southward interspersed with areas of NeB. In Middletown through Coasters Harbor, the soil classification is primarily UD or Ur (Urban land), with a lengthy stretch of NP (Newport-Urban land complex) heading toward Newport and the conclusion of the rail line.

The dominant soil series along the rail corridor include UD, NeB/C, PmB, and NP, each of which will be discussed individually below.

Udorthents-Urban land complex (UD) soils consist of moderately well-drained to excessively drained soils that have been disturbed by cutting or filling, and areas that are covered by buildings and pavement. The permeability and stability of this unit are variable, as the complex is about 70 percent Udorthents, 20 percent Urban land, and 10 percent other soils. Udorthents soils are generally very steep and used for summer recreation activities such as sunbathing and hiking. The unit is unsuited or poorly suited to most other uses

[5] *Recognized Environmental Condition* as defined by American Society for Testing and Materials ("ASTM") Standard Practice E-1527, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process* – the presence or likely presence of any hazardous substances or petroleum products on a property under conditions which indicate an existing release, a past release, or a material threat of release of any hazardous substances or petroleum products into structures, or the ground, groundwater or surface water of the property.

because of slope, position on the landscape, erosion, and exposure to winds and salt spray. Urban land soil areas consist mostly of sites for buildings, paved roads, and parking lots.

Newport silt loam (NeB/C) soils are primarily located on the side slopes of drumlins and glacial till plains in southeastern Rhode Island. Slopes range from 3 to 8 percent for NeB soils and from 8 to 15 percent for NeC soils. Typically, the surficial soil layer is very dark brown silt loam. The subsoil is olive brown and olive silt loam 16 inches thick. The substratum is olive gray channery silt loam to a depth of 60 inches or more. The permeability of this soil is moderate to moderately rapid in the surface layer and subsoil and slow to very slow in the substratum. This soil is suitable for community development, but it is limited due to a slow permeability in the substratum of the substratum. However, this soil is suited to cultivate crops and some areas are used for farming.

Pittstown silt loam (PmB) soils are primarily located on side slopes of glacial upland hills and drumlins. Slopes range from 3 to 8 percent. Typically, the soil contains a very dark grayish brown silt loam surface layer followed by a dark yellowish brown and olive brown silt loam subsoil. The substratum is olive gray, mottled channery silt loam, and it can extend to a depth of 60 inches or more. The permeability of this soil is moderate in the surface layer and subsoil and slow in the substratum. Available water capacity is moderate, and runoff is medium.
Newport-Urban land complex (NP) soils are primarily located on drumlins and glacial till plains of densely populated areas. Slopes are about 6 percent but can range from 1 to 15 percent. Typically, the Newport soils have a surface layer of very dark brown silt loam followed by an olive brown and olive silt loam subsoil. The substratum is olive gray channery silt loam, and it can extend to a depth of 60 inches or more. The permeability of this soil is moderate to moderately rapid in the surface and subsoil layers and slow to very slow in the substratum. Available water capacity is moderate, and runoff is medium to rapid. Areas of this complex are used mainly for residential complexes, shopping centers, and other urban development purposes. (*Soil Survey of Rhode Island,* 1981)

4.5.2.1 Surficial Geology

The surficial geology in the vicinity of the rail corridor is dominated primarily by the *Narragansett till plains*. Till is an ice-deposited sediment, and it is highly variable in texture (clay to large boulders), composition, thickness, and structural features. This variability is often reflected in its hydraulic properties. These till plains make up the area immediately surrounding Narragansett Bay and are composed of glacial till derived from sedimentary rock, shale, sandstone, and conglomerate. These Pleistocene sediments were deposited 12,000 years ago during the Wisconsin glacial period. The till is generally compacted, dark gray to olive-colored, and it is of a finer texture than the till derived from granitic rock. The region contains few bedrock outcrops, and is dominated by drumloidal landforms smoothed by the prior glaciation. The Newport soils often formed within these deposits. (*Soil Survey of Rhode Island,* 1981)

4.5.2.2 Bedrock Geology

The Narragansett Bay area, containing the rail corridor, is located within the Narragansett Basin, a synclinal feature stretching 55 miles northward toward Hanover, Massachusetts. The bedrock formations in Rhode Island are almost completely mantled by deposits of outwash and glacial till. Bedrock and consolidated rocks within the rail corridor can be categorized into crystalline (igneous and metamorphic) and sedimentary rocks. Two distinct formations can be observed within the rail corridor; older igneous granitic rock of several ages and compositions in Tiverton, and the Rhode Island Formation, a suite of Pennsylvanian-age sedimentary rocks south of the bridge and throughout the remainder of the rail corridor and the Narragansett Bay area. (*Soil Survey of Rhode Island,* 1981)

The granitic rocks found in the northern reaches of the rail corridor include the pre-Pennsylvanian Bulgarmarsh granite, Metacom granite gneiss, and porphyritic granite, as well as slate and quartzite. These rocks also become exposed to the south in Newport Neck. The Rhode Island Formation has an approximate

thickness of 10,000 feet and its composition can be described as fine to coarse conglomerate, sandstone, graywacke, arkose, shale, and meta-anthracite. (CDM, *Final SIP Report, Melville North Area,* 1995)

4.5.2.3 Groundwater

The rail corridor is contained within the Narragansett Bay Basin, the most extensive basin in Rhode Island. The basin includes the system of waterways that discharge into the Atlantic Ocean between Point Judith in Narragansett and Sakonnet Point in Little Compton. The Narragansett Bay Basin also contains the watershed tributaries to Narragansett Bay as well as the small waterways that flow into the Atlantic Ocean from Sakonnet Point east to the Massachusetts-Rhode Island state line in Tiverton, at the northernmost extent of the rail corridor. In the vicinity of the rail corridor, groundwater is generally flowing to the west, toward Narragansett Bay.

Groundwater in the vicinity of the corridor is classified as mainly as GA by Rhode Island Geographical Information Systems ("RIGIS"), with a small area of GB classification in the vicinity of Melville and a more extensive area of GB classification extending from the Navy piers south past Newport Gateway and the southern terminus of the rail corridor. According to RIDEM, class GA groundwater consists of groundwater resources that are designated to be suitable for public or private drinking water use without treatment. Groundwater classified as GB consists of groundwater resources that have been designated not suitable for public or private drinking water use. Groundwater located beneath highly urbanized areas with dense concentrations of industrial and commercial activity, permanent waste disposal areas, and areas immediately surrounding the permanent waste disposal area may be classified as GB. No Community and/or Non-Community Wellhead protection areas are located in the immediate vicinity of the rail corridor.

4.5.2.4 Surface Water

The nearest surface water bodies to the rail corridor consist of coastal portions of eastern Narragansett Bay, the Mount Hope Bay, and the upper reaches of the Sakonnet River near the Sakonnet swing bridge. The Narragansett Bay is rated use Class SA, which is presumed to be suitable for shellfish harvesting for direct human consumption, primary and secondary contact recreational activities, and fish and wildlife habitat. Class SA waters are also considered suitable for aquacultural uses, navigation, and industrial cooling with good aesthetic value. The Mount Hope Bay is rated use Classes SA and SB in the vicinity of the rail corridor. Waters immediately north of the Sakonnet swing bridge are rated use Class SB, while waters to the west between Bristol and Portsmouth are rated use Class SA. Class SB waters are presumed to be suitable for primary and secondary contact recreational activities; shellfish harvesting for controlled relay and depuration; and fish and wildlife habitat. Class SB waters are also considered suitable for aquacultural uses, navigation, and industrial cooling with good aesthetic value. The upper reaches of the Sakonnet River near the Sakonnet swing bridge are rated use Class SB as well.

Additionally, numerous small coastal inlets are classified along the coast of Portsmouth, Middletown, and Newport. These inlet waters are rated as use Class SB/SB1/SB{a}. Class SB1 waters are presumed to be suitable for primary and secondary contact recreational activities and fish and wildlife habitat. They are suitable for aquacultural uses, navigation, and industrial cooling with good aesthetic value. However, primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges. For waters rated SB{a}, {a} indicates a partial use designation due to impacts from CSOs. (RIDEM, *Water Quality Regulations,* 1997)

4.5.3 History

The rail corridor was established in 1864 by the Old Colony and Newport Railroad. At the peak of service in 1913, the rail corridor served eleven passenger trains a day in each direction until 1929, when the Mt. Hope Bridge was constructed. The ridership decline caused the discontinuation of all passenger service in 1938.

The rail corridor is currently owned by RIDOT, which is leasing the rail corridor to two firms to operate tourist and dinner trains. The rail corridor is approximately 16 miles in length from mileposts 0.0, at

Newport, to 15.8 at the Rhode Island and Massachusetts state border, in Tiverton. On Aquidneck Island, consisting of the towns of Newport, Middletown, and Portsmouth, the rail corridor is situated along the western coast with a north/south orientation. In Tiverton, the rail corridor is also situated along the coast with a north/south orientation.

4.5.4 Review of Public Records

In order to supplement and cross-reference the information received from various government agencies, Berger reviewed a search of Federal and State databases conducted by Vistainfo of San Diego, California. If any information about the rail corridor or properties in the vicinity was found, a discussion of the listing is presented in the text under the appropriate classification. Dates shown are those of the most recent updates to the databases. A complete copy of the database report is contained in Appendix B.

4.5.4.1 Federal Environmental Review

Berger reviewed information from the following federal databases, identified by ASTM Standard E1527, as sources of information relevant to the Phase I Environmental Site Assessment process.

- Resource Conservation and Recovery Information System ("RCRIS") List, (June 2000)
- RCRA Treatment, Storage, or Disposal ("TSD") Facilities List (June 2000)
- Corrective Action Report ("CORRACTS") (June 2001)
- Comprehensive Environmental Response, Compensation and Liability Information System ("CERCLIS") List, (July 2001)
- U.S. Environmental Protection Agency ("EPA") CERCLIS No Further Remedial Action Planned ("NFRAP") (July 2001)
- National Priorities List ("NPL"), (July 2001)
- Emergency Response Notification System ("ERNS") List, (December 2000)

4.5.4.1.1 RCRIS List

The RCRIS list is a compilation of records from a nationwide database created to maintain and regulate sites or facilities that handle, treat, store, or dispose of hazardous wastes under the Resource Conservation and Recovery Act ("RCRA"). Inclusion on the list is not necessarily indicative of contamination; rather, it indicates the presence of potential sources of contamination.

The discussion of RCRA sites is divided into two sub-sections, which differentiate the RCRA sites located on private properties and the Federal Defense Department property.

4.5.4.1.1.1 RCRIS Sites Located on Private Properties

Review of the November 12, 2001 list of RCRA listings revealed five sites located within a 400-foot offset from the centerline of the rail corridor. No adjoining RCRA sites were detected in the results. Instead, the properties that have greater potential to impact the rail corridor are reviewed. The following properties were reviewed at Rhode Island Department of Environmental Management ("RIDEM"):

- Whitey's Auto Repair, 110 Bay St., Tiverton, RI;
- TPI Composites, 225 Alexander Rd., Portsmouth, RI;
- U-Haul Center of Newport, 111 Connell Hwy., Newport, RI; Viking Tours of Newport, 88 Connell Hwy., Newport, RI; and
- Pine's Body and Fender Repair, 51 Gould Street, Newport, RI.

The items listed are discussed as follows:

- **Whitey's Auto Repair, 110 Bay St., Tiverton, RI (milepost 15.5)**

Whitey's Auto Repair was identified as RCRIS Small Quantity Generator ("SQG") No. RID019553502. According to RIDEM Biennial Report for year 1989, Whitey's Auto Repair generated less than 100 kilograms per month of waste oil. Whitey's Auto Repair also employed "Safety Kleen" parts cleaner, which was recycled every six weeks. No information was found on any violation in the RIDEM file.

- **TPI Composites, 225 Alexander Rd., Portsmouth, RI (milepost 7.3)**

TPI Composites was identified as RCRIS SQG No. RI5000001081. According to the EPA Notification of Hazardous Waste Activity, Whitey's Auto Repair generated less than 100 kilograms per month of hazardous waste. No information was given to the type of waste. No information was found on any violation in the RIDEM file.

- **U-Haul Center of Newport, 111 Connell Hwy., Newport, RI (milepost 0.8)**

The U-Haul Center of Newport was identified as RCRIS SQG No. RID980521355. According to the EPA Notification of Hazardous Waste Activity (September 8, 1988), the U-Haul Center of Newport generated less than 100 kilograms per month of hazardous waste with ignitable characteristics. No information was found on any violation in the RIDEM file.

- **Viking Tours of Newport, 88 Connell Hwy., Newport, RI (milepost 0.7)**

Viking Tours of Newport was identified as RCRIS SQG No. RI5000010652. According to the EPA Notification of Hazardous Waste Activity, Viking Tours of Newport generated less than 100 kilograms per month of waste oil from buses. No information was found on any violation in the RIDEM file.

- **Pine's Auto Body & Fender Repair, 51 Gould St., Newport, RI (milepost 0.2)**

Pine's Auto Body was not identified with a RCRIS Number. According to the RIDEM Notification of Hazardous Waste Activity, Pine's Auto Body generated less than 100 kilograms per month of hazardous waste, with ignitable characteristics. No information was given to the type of waste. No information was found on any the violation in the RIDEM file.

RCRA TSD Facilities List

A search of the November 12, 2001 RCRIS list revealed two TSD facilities located within a 400-foot offset from the centerline of the rail corridor.

- **U.S. Navy, Naval Education and Training Center ("NETC"),** Public Works Dept., Middletown, RI 02842; and
- **Eastern Resorts,** 125-135, 126-128 Long Wharf, Newport, RI 02840.
  The U.S. Navy site is currently under review for location.

The Eastern Resorts sites are located downgradient from the rail corridor and adjacent to Narragansett Bay. As a result, no impacts from the Eastern Resorts sites to the rail corridor is anticipated and, therefore, Berger did not review RIDEM files on these sites.

RCRA CORRACTS Facilities List

A search of the November 12, 2001 CORRACTS list revealed one facility located within a 400-foot offset from the centerline of the rail corridor, which was the U.S. Navy, NETC, Public Works Dept., Middletown, RI 02842. Berger is currently reviewing location information with regard to U.S. Navy sites within the rail corridor.

CERCLIS-Listed Facilities

The CERCLIS list is a compilation of records from a nationwide database created to maintain and regulate those facilities or sites that the EPA has investigated or will investigate for suspected or uncontrolled releases of hazardous substances, contaminants or pollutants as reported by states, municipalities, private companies and private citizens under the Comprehensive Environmental Response, Compensation and Liability Act

(CERCLA or the Superfund Program). Once a site is placed on the CERCLIS list, it may be subjected to several additional levels of evaluation, to determine the severity of the contamination from discovery and preliminary assessment to site inspection, and possibly the application of the HRS. Such a determination could ultimately place the site under consideration for inclusion on the NPL. Inclusion on the CERCLIS list does not confirm the presence of an environmental problem or a public health threat.

The discussion of CERCLIS sites is divided into two sub-sections, which differentiate the CERCLIS sites located on private properties and the Federal Defense Department property.

4.5.4.1.4.1 CERCLIS Sites Located on Private Properties
Review of the November 12, 2001 list of CERCLIS listings revealed seven sites located within a 400-foot offset from the centerline of the rail corridor. One adjoining CERCLIS site was detected in the results. In addition, the properties that have greater potential to impact the rail corridor were reviewed. The following properties were reviewed at RIDEM:

- Melville North Landfill, Structure 214, Portsmouth, RI;
- Melville North Landfill, sludge drying bed, Portsmouth, RI;
- Melville North Landfill, Portsmouth, RI;
- McAllister Point Landfill, Middletown, RI;
- Derektor Shipyard, Coddington Cove, Middletown, RI;
- Naval Undersea Warfare Center ("NUWC") Disposal Area, Middletown, RI; and
- U-Haul Facility, 111 Connell Highway, Newport, RI.

The items listed are discussed as follows:

- **Melville North Landfill, Structure 214, Portsmouth, RI (milepost 6.9)** [6]

According to the EPA Final Site Inspection Prioritization Report of August 25, 1994, Structure 214 (CERCLIS No. RID981064249) was located adjoining and north of the Sludge Drying Bed, indicated with a locus map (see Appendix C) and within the ROW. In 1980, the U.S. Navy stored eight drums of waste oil adjacent to Structure 214, which had no secondary containment. The U.S. Navy reported that waste oil spills had occurred at Structure 214. Drums were removed on May 1982. According to the site sketch, the soil under the drums was stained.

Based on the proximity of the Structure 214, reported contamination, and no information on remediation, this site may pose a REC with respect to the rail corridor.

- **Melville North Landfill, Sludge Drying Bed, Portsmouth, RI (milepost 6.8)**[6]

According to the Final Site Inspection Prioritization Report of August 25, 1994, the Sludge Drying Bed (CERCLIS No. RID981064306) was located adjoining and north of Melville North Landfill, indicated with a locus map (see Appendix C) and adjoining to the west side of the ROW. The Sludge Drying Bed area was a 15-foot by 40-foot sludge drying bed that the U.S. Navy used to dispose of waste oil. No other specific information regarding the sludge bed was found.

Based on the proximity of the Sludge Drying Bed and undetermined contamination, this site may pose a REC with respect to the rail corridor.

- **Melville North Landfill, Portsmouth, RI (milepost 6.6)** [6]

[6] On August 1, 2002, Mr. Kulpa state that the report submitted by the Navy regarding the Melville North Landfill (Parcels 11, 12, and 13) had not yet been accepted to RIDEM. Therefore, this report reflects the most recent data on record.

According to the EPA Final Site Inspection Prioritization Report (July 18, 1994), the Melville North Landfill (CERLIS No. RID981064421) was an inactive landfill located adjoining to the west side of the ROW (see report's locus map in Appendix C). The landfill was situated in a low-lying, wetland-type area along the shoreline of Narragansett Bay, Weaver Cove. There were no buildings or other structures on the site. The U.S. Navy utilized the landfill from World War II (approximately 1939) to 1955. At the time of the report, Melville Marine Industries owned the landfill property and surrounding areas. The wastes within the landfill remained in place at the site with the presumed types of waste listed as follows:

- Domestic Trash;
- Spent acids;
- Waste paints;
- Solvents;
- Waste oil (diesel, fuel and lube);
- Polychlorinated Biphenyls ("PCBs");
- Scrap metal; and
- Wood debris.

Illegal dumping had been reported at Melville North Landfill before Melville Marine Industries purchase the land in 1984. TRC Environmental Consultants ("TRC") conducted extensive field studies at the landfill in conjunction with the remedial investigation of the landfill. A summary of analytical results of samples taken is shown in Table 4-2.

Table 4-2
Highlights of Analytical Results Source Sample Analysis for Melville North Landfill By TRC

Sample Location	Media Type	Compound/Element	Maximum Concentration
SS-1	Surface Soil	PCB (Aroclor-1260)	8,000 ppb
SS-5*	Surface Soil	Copper	135 ppm
SS-5*	Surface Soil	Zinc	547 ppm
B-3	Soil Boring	4,4' – DDT	160 ppb
B-4	Soil Boring	Carbon Disulfide	12 J ppb
B-9	Soil Boring	Mercury	2 ppm
B-9	Soil Boring	Lead	5,920 ppm
B-12	Soil Boring	Benzene	83 ppb
MW-3	Soil Boring	Iron	52,600 ppm
MW-4*	Soil Boring	1,4-Dichlorobenzene	7,900 ppb
MW-4*	Soil Boring	Ethylbenzene	2,300 J ppb
MW-4*	Soil Boring	Xylenes	11,000 ppb

Source: EPA
* Location is adjacent (60 to 80 feet) to the west right-of-way line of the ROW
ppb: parts per billion
ppm: parts per million
J: Quantitation is approximate due to limitations identified during the quality control review.

According to the Final Site Inspection Prioritization Report, by EPA, the groundwater underlying the landfill flowed west into Narragansett Bay and was hydraulically connected to Narragansett Bay.

Based on the proximity of the Melville North Landfill and well documented contamination, this site may pose a REC with respect to the rail corridor.

- **Derektor Shipyard, Coddington Cove, Middletown, RI (milepost 2.4)**

The Derektor Shipyard site adjoins the east side of the rail corridor. Prior to 1940, this property was farm land. It was acquired by the U.S. Navy in 1940 for use as a supply station and received heavy use during World War II when barracks, warehouses, and quonset huts were constructed on the property. In the 1960s, the Navy used the property to pier warships. In 1973, the Navy left the property. From 1979 to 1992, the property was subleased by the Rhode Island Port Authority to Derektor Shipyard, which performed ship manufacturing on the property. In 1992, Derektor filed for bankruptcy.

Many areas of environmental concern were identified on this property, which included the following:

- Waste oil;
- Paints;
- Solvents;
- Thinners;
- Sodium Hydroxide;
- Spent sand blast grit;
- Used oil;
- Underground storage tanks ("USTs");
- Aboveground storage tanks ("ASTs");
- Storm drain system;
- Abandoned 55-gallon drums; and
- Other waste solids and liquids.

Subsurface investigations included test pitting, soil sampling, soil borings, and groundwater monitoring well installation. Brown and Root concluded, "Much of the soil contamination was localized and apparently related to surficial discharges. Low concentrations of contaminants were also detected in groundwater samples collected at the site."

A human health risk assessment performed on the property indicated that the primary contaminants of concern were polychlorinated biphenyls ("PCBs") and arsenic. PCBs in soil north of Building 6 were determined to have the potential to cause a risk of cancer in site workers above the U.S. EPA's recommended target level of 1 in 100,000 incremental cancer risk. Building 6 is on the Bay side of the railroad tracks.

An ecological risk assessment found that "the likelihood for an interaction that would cause (ecological) receptors to be affected by the contaminants present is extremely low." In the 1997 report, Brown and Root recommended limited soil remedial excavations at several areas but did not recommend a Remedial Investigation/Feasibility Study under CERCLA.

Based on the upgradient location and proximity of the Derektor Shipyard, and documented contamination, this site may pose a REC with respect to the rail corridor.

- **U-Haul Facility, 111 Connell Highway, Newport, RI (milepost 0.8)**

The discussion of the U-Haul site is in Leaking Underground Storage Tank ("LUST") section (see Section 8).

4.5.4.1.4.2 CERCLIS Sites Located on U.S. Navy Property

Review of the May 9, 2002 list of CERCLIS listings revealed two sites located within the 400-foot offset from the centerline of the rail corridor. One adjoining CERCLIS site was detected in the results. In addition, the properties that have greater potential to impact the rail corridor were reviewed. The following properties were reviewed at RIDEM:

- **McAllister Point Landfill, Middletown, RI (milepost 3.8)**

The McAllister Point Landfill is located adjoining to the west side of the rail corridor. According to the Draft Final Remedial Investigation Report (1994), the McAllister Point Landfill covered an 11.5-acre area. It was characterized by a mounded area in the central to north-central portion of the site. McAllister Point Landfill was first used in 1955 following the closure of the Melville North Landfill, which continued to operate until the mid-1970's. During the period of operations, McAllister Point Landfill received wastes from all of the industrial activities associated with the Navy. Materials reported disposed of at the landfill included spent acid, paints, solvents, waste oils (diesel, lube, and fuel), and PCB transformer oil. In 1965, an incinerator was constructed, which operated between 1965 and 1972, at the landfill to burn approximately 98% of the waste before the ash was disposed of in the landfill. Following the landfill closure, a three-foot soil cap was reportedly placed over the site.

A Phase I study which evaluated the soil and groundwater of the McAllister Point Landfill detected the following compounds in the soil:

- Volatile organic compounds ("VOCs");
- Semi-volatile organic compounds ("SVOCs");
- Pesticides;
- PCBs;
- Polynuclear aromatic hydrocarbons ("PAHs"), including carcinogenic PAHs;
- Antimony;
- Arsenic;
- Barium;
- Cadmium;
- Calcium;
- Chromium;
- Cobalt;
- Copper;
- Lead;
- Manganese;
- Magnesium;
- Nickel;
- Silver;
- Vanadium; and
- Zinc.

PCBs were detected in almost 50% of the subsurface soil samples with the maximum concentration of 1.1 ppm.

The compounds detected in the groundwater included the following:

- VOC;
- SVOC;
- PAHs;
- PCBs;
- Antimony;
- Arsenic;
- Beryllium;
- Cadmium;
- Chromium;
- Copper;

- Lead;
- Mercury; and
- Nickel.

A human health evaluation was conducted for the McAllister Point Landfill site on the basis of Phase I findings. The exposure scenarios considered in the human health evaluation included both current use and potential use scenarios including trespassing, recreational use, on-site construction, commercial and industrial use, and residential use. Both cancer risks and non-cancer risks were evaluated using available regulatory guidance. Total cancer risks were determined to exceed the acceptable risk range of $1x10^{-4}$ to $1x10^{-6}$ under commercial and residential use.

During the site inspection walk through, March 28, 2002, Berger observed that the McAllister Point Landfill was undergoing the final phase of construction activities. The surface of the landfill was re-established with grass, vents, new rip rap for slope protection and fencing.

More information from the construction/remediation activities to determine whether the site is a REC with respect to the rail corridor.

- **NUWC Disposal Area, Middletown, RI (milepost 3.4)**

Documents available for this property consisted of mostly environmental site assessment work plans. According to Mr. Kulpa, this site is currently under the jurisdiction of the U.S. Army Corps of Engineers. Mr. Kulpa stated that petroleum contamination is currently present on this site but that no remediation is currently taking place. This property is shown on figures photocopied from the 1994 TRC report for the McAllister Point Landfill site (see above) and is believed to be upgradient from the Aquidneck Rail line.

Based on the upgradient location and proximity of the NUWC Disposal Area, and documented contamination, this site may pose a REC with respect to the rail corridor.

USEPA CERCLIS NFRAP Sites

A search of the November 12, 2001 CERCLIS NFRAP listed nine sites located within a 400-foot offset from the centerline of the rail corridor, which are the following:

- Long Wharf Area, Corner of Long Wharf and Washington Street, Newport, RI;
- STP Sludge Drying Bed (next to Melville North Landfill), Portsmouth, RI;
- Structure 214 (north of Melville North Landfill), Portsmouth, RI;
- Portsmouth Abandoned Mine, West Shore Road RR Tracks, Portsmouth, RI;
- Melville North Landfill, Burma Road, Portsmouth, RI;
- Melville North Area, Maritime Drive, Portsmouth, RI;
- Gould Island Bunker #11, Southeastern Shore of Gould Island, Middletown, RI;
- Gould Island Disposal Area, Western Shore of Gould Island, Middletown, RI; and
- Melville Terminal, Portsmouth, RI.

The Long Wharf Area site is located down gradient from the rail corridor and adjacent to Narragansett Bay. As a result, no impacts from the Long Wharf Area to the rail corridor is anticipated and, therefore, are not reviewed at RIDEM.

The STP Sludge Drying Bed, Structure 214, and Melville North Landfill sites are discussed in the CERCLIS facilities (Section 4).

No impacts from Gould Island sites, which is located in Narragansett Bay, are anticipated to affect the rail corridor, due to the hydraulic barrier of Narragansett Bay.

NPL Facilities
The EPA's NPL (or Superfund List) is a federal listing of uncontrolled or abandoned hazardous waste sites that pose a potential risk to human health or the environment. The list is created from the CERCLIS database (see below) and is primarily based upon a score that each site or facility receives from the EPA's Hazard Ranking System (HRS). After a site or facility has been identified as a CERCLIS site, the EPA conducts an assessment of the property. The HRS score associated with the degree of environmental risk found is one of the determinations made as to whether the site is placed on the NPL. These sites are then prioritized for possible long-term remedial action and referred to the state for further action under state programs.

Review of the November 12, 2001 NPL sites listing confirmed eight sites located within one-mile radius of the rail corridor.

USPA ERNS List
The ERNS list is a compilation of records from a national computer database and retrieval system created to store information on accidental releases of oil and hazardous substances. The information stored in this database is acquired through the National Response Center. Each reported incident is required to contain and provide the discharger name, date of release, amount released, and type of substance released. The database did not identify the rail corridor as an ERNS site.

A search of the November 12, 2001 ERNS list revealed 93 listings located within a 400-foot offset from the centerline of the rail corridor.

4.5.4.2 State of Rhode Island Department of Environmental Management
Berger reviewed information from the following state databases, identified by ASTM Standard E1527, as sources of information relevant to the Phase I Environmental Site Assessment process.

- UST Registration and Closure Database (May 2001)
- RIDEM Registered AST Facility Database (May 2001)
- LUST (August 2001)
- State spills (August 2001)
- State Hazardous Waste Site ("SHWS") Database (Including Equivalent NPL and CERCLIS Sites) (June 2001)

The rail corridor was not identified in the UST databases.

4.5.4.2.1 Underground Storage Tanks
The discussion of USTs is divided into two sub-sections, which differentiate the USTs located on private properties and the Federal Defense Department property.

4.5.4.2.1.1 USTS Located on Private Properties
Berger reviewed data obtained from RIDEM's UST Inventory for listings of former and existing UST's deemed to lie within 400 feet from the center line of the of rail corridor. Review of the May 9, 2002 list of USTs, revealed 6 sites containing USTs are located within the 400 feet offset from the center line of the rail corridor.

- TPI, Inc., 225 Alexander Rd., Portsmouth, RI; and
- Bayside Village, 13 Rolling Green Rd., Newport, RI.

The detail discussions of the USTs located on the Bridge Gulf, Viking Tours of Newport, U-Haul, and Green Animals Museum properties are listed in the LUST sections.

The listed items are discussed as follows:

- **TPI, Inc., 225 Alexander Rd., Portsmouth, RI (milepost 7.3)**

According to the RIDEM UST Registration form (August 30, 1993), a 10,000-gallon, steel UST was closed on September 9, 1993. The UST contained no. 2 fuel oil. The RIDEM inspector described that the UST and piping had little corrosion and no holes were found. No free product was found in the soil. RIDEM issued a "no further action required" on September 29, 1993.

- **Bayside Village, 13 Rolling Green Rd., Newport, RI (milepost 0.9)**

According to the RIDEM UST Registration form (February 21, 2000), there were three UST located on the Bayside Village property. All had 5,000-gallon capacity and contained heating oil. The USTs became operational in 1972. According to the tightness test result (April 27, 2000) of the three USTs, one failed. A report by Cyn Environmental Services (November 3, 2000), an unknown volume of No. 2 oil was released due to a failed feed and return line at 5,000-gallon UST, discovery on August 24, 2000. Additional information was designated as "Not available for public review."

4.5.4.2.2 Registered AST Facility Database

The discussion of ASTs is divided into two sub-sections, which differentiate the ASTs located on private properties and the Federal Defense Department property.

4.5.4.2.2.1 ASTS Located on Private Properties

Berger reviewed data obtained from RIDEM's AST Inventory for listings of existing AST's deemed to lie within 400 feet offset from the center line of the of rail corridor. Review of the May 9, 2002 list of ASTs, revealed one private property site containing ASTs.

The Island Fuel Terminal, located at 25 State Avenue, Tiverton, RI., (a bulk terminal, milepost 15.6) was reviewed for release of OHM. In relation to the rail corridor (based on observations during the site inspection), the site was located abutting the rail corridor on the west side, which is in the lower gradient. However, due to the large capacity of the ASTs, a release of OHM could impact the rail corridor. The Island Fuel Terminal has a total of eleven ASTs with the storage capacity range of 1.7 hundred thousand gallons to 5.5 million gallons. Five ASTs were located adjoining to the west ROW line, which are listed as follows:

- AST no. 1 contained no. 2 fuel oil with 3.4 million gallon capacity;
- AST no. 2 contained kerosene with 2.3 million gallon capacity;
- AST no. 3 contained no. 2 fuel oil with 2.3 million gallon capacity;
- AST no. 8 contained no. 2 fuel oil with 5.5 million gallon capacity; and
- AST no. 9 contained no. 2 fuel oil with 5.5 million gallon capacity.

Berger did not find groundwater quality monitoring information related to the Island Fuel Terminal. Information regarding a network of monitoring wells was found. The adjacent ASTs represent a REC.

4.5.4.2.3 Leaking Underground Storage Tanks

The discussion of LUSTs is divided into two sub-sections, which differentiate the LUSTs located on private properties and the Federal Defense Department property.

4.5.4.2.3.1 LUSTS located on Private Properties

Berger reviewed data obtained from RIDEM's LUST inventory for listings of LUST deemed to lie within a 400-feet offset from the centerline of the rail corridor. Berger reviewed four LUST sites on private properties. The rail corridor was not identified in this database.

- Green Animals Museum, 380 Corys Lane, Portsmouth, RI;
- U-Haul International, 111 Connell Highway, Newport, RI;

- Viking Tours of Newport, Inc., 88 Connell Highway, Newport, RI; and
- Bridge Citgo, 58 Van Zandt Avenue, Newport, RI.

The items listed are discussed as follows:

- **Green Animals Museum, 380 Corys Lane, Portsmouth, RI (milepost 8.2)**

According to the RIDEM Closure Inspection sheet, May 4, 1998, a 1,000 gallon UST of no. 2 oil was removed. The UST was in "terrible" condition at the time of removal with two large holes, which had the approximate diameter of a hand. In addition, the UST bottom was "totally stained." The inspection sheet stated that the soil was saturated with No. 2 oil. The contaminated soil was removed.

An UST Closure Assessment Report was submitted to RIDEM in November of 1998 that stated, "visual observations, headspace analysis, and laboratory analysis of the soil samples indicated a release of petroleum products to the surrounding area of the UST. The total petroleum hydrocarbon ("TPH") level under the UST indicated less than the GA limit groundwater classification, no further environmental investigation of the site is warranted at this time."

Based on the UST Closure Assessment Report, this site does not appear to pose a REC with respect to the rail corridor.

- **U-Haul International, 111 Connell Highway, Newport, RI (milepost 0.8)**

According to RIDEM Closure Inspection sheet, February 23, 1995, U-Haul removed two USTs, which were UST no. 1 (5,000 gallon, diesel) and UST no. 2 (5,000 gallon, gasoline). The tank condition of both USTs was slightly corroded with no visible holes. The soil condition, however, was impacted by petroleum with the report of very strong gasoline odor at the filler and lines. The RIDEM Closure Inspection also indicated that there was a sheen present in the groundwater. An UST Closure Assessment Report was submitted, which stated that, based on the analytical results, the contaminated soil have been removed and no further excavation is warranted, and the groundwater had elevated BTEX concentrations. The UST Closure Report recommended that monitoring wells should placed to determine the extent of the contamination. A RIDEM letter, April 23, 1997, stated that the downgradient monitoring wells showed the presence of VOCs and semi-VOCs at very low concentrations, the GB groundwater standards for VOCs and SVOCs were not exceeded in any of the wells. As a result, RIDEM issued "no further action is required at this time."

Based on the UST Closure Assessment Report and RIDEM letter, this site does not appear to pose a REC with respect to the rail corridor.

- **Viking Tours of Newport, Inc., 88 Connell Highway, Newport, RI (milepost 0.7)**

According to the RIDEM Closure Certificate, October 9, 1997, three USTs were removed, which included a 6,000-gallon diesel tank, a 5,000-gallon gasoline tank, and a 5,000-gallon diesel tank. The site was designated as a LUST site, which required "soil removal only" (occurred on August 8, 1997). According to the UST Closure Assessment Report, by Applied Enviro-Tech, Inc., RIDEM received date September 19, 1997, the low level of VOCs is consistent with a GA groundwater classification; therefore, Applied Enviro-Tech, Inc. recommends no further action be initiated following the removal of the stockpiled soil. According to the RIDEM letter, October 8, 1997, the site obtained the status of "no further action is presently required."

Based on the UST Closure Assessment Report and RIDEM letter, this site does not appear to pose a REC with respect to the rail corridor.

- **Bridge Citgo, 58 Van Zandt Avenue, Newport, RI, (milepost 0.4)**

According to RIDEM letter, December 14, 1998, Bridge Citgo was to remove five USTs. They are listed as follows:

- UST no. 1 contained gasoline with 9,200-gallon capacity;
- UST no. 2 contained gasoline with 6,000-gallon capacity;
- UST no. 3 contained diesel with 5,000-gallon capacity;
- UST no. 4 contained gasoline with 10,000-gallon capacity; and
- UST no. 5 contained diesel with 5,000-gallon capacity.

During the removal activities on December 22, 1998, evidence of significant petroleum release was observed. An UST Closure Assessment Report was submitted on March 18, 1999 by Sage Environmental ("SAGE"). The UST Closure Assessment Report indicated that the soil results conducted during the UST removal showed that the subsurface soils in the former UST field had been impacted by petroleum constituents. In conducting the site investigation prior to remedial excavation, SAGE was able to determine the extent of the impact of subsurface soil and groundwater at the site, which resulted in volume estimates of impacted soil. SAGE concluded that a quarterly monitoring of groundwater for VOC attenuation should implemented. According to SAGE, the groundwater flow direction was north.

According to the quarterly monitoring report, by SAGE, March 21, 2001, concentrations of BTEX and methyl tert-butyl ether ("MTBE") were in compliant with RIDEM Method 1, GB, Groundwater objectives in monitoring wells MW-1, MW-2, and MW-3. However, monitoring well MW-1E had concentrations of BTEX exceeded the Method 1, GB criteria.

Based on the quarterly monitoring report, this site may pose a REC with respect to the rail corridor.

4.5.4.2.3.2 LUSTS Located ON U.S. Navy property

Berger reviewed data obtained from RIDEM's LUST inventory for listings of LUST deemed to lie within a 400-foot offset from the centerline of the Rail Corridor. However, some sites outside and adjacent of the 400-foot offset were included due to the possible impacts to the Rail Corridor. Berger reviewed five LUST sites on U.S. Navy property (Tank Farms 1 through 5). Information from other sites were obtained from Mr. Kulpa of RIDEM at a meeting on May 7, 2002. He was also interviewed on June 11, and August 1, 2002. The Rail Corridor was not identified in this database.

- Tank Farm 1 (LS-2704);
- Tank Farm 2 (No specific records found-see Current Status of Tank Farms);
- Tank Farm 3 (LS-2704);
- Tank Farm 4 (LS-2712);
- Tank Farm 5 (LS-2227);
- U.S. Navy Fuel Line;
- Midway pump house; and
- Derektor Shipyard.

The Tank Farms 1 through 5 sites are located east and upgradient of the Rail Corridor. The U.S. Navy Fuel line, which connects all the tank farms, is situated on the east side and along Burma Road. The pipeline crosses Burma Road and Rail Corridor to refueling points along the western coast of Aquidneck Island. Midway pump house is located 800 feet north of Greene Lane and 50 feet east of the tracks. During a PCB cleanup at Derektor Shipyard, Free gasoline product was discovered adjacent to the Rail Corridor.

Tank Farm History

In 1941, the U.S. Navy began construction of five tank farms (Tank Farms 1 through 5) to store fuel oils and other petroleum products to supply warships.

The USTs[7] at Tank Farm 5 were constructed between 1942 and 1943, and used for fuel storage from World War II to 1974. Tank Farm 5 consisted of eleven USTs. By 1974, the farm was abandoned except for Tanks 53 and 56. In 1975, the Navy began using Tanks 53 and 56 for waste oil storage as part of an oil recovery and recycling program. Between 1975 and 1982, the waste oil was utilized as an alternate heating oil.

Tank Farm 4 was constructed as a war measure from 1942 and 1943 on the Navy property to support the fueling requirements of the Newport-based Atlantic Fleet. The tank farm consists of twelve 2.52 million-gallon concrete USTs[5]. The tanks were used to store heavy fuel oils and No. 2 fuel oil, from World War II until 1974. For a brief period, three of the four tanks were leased to a private petroleum distribution company, which stored No. 2 fuel oil. By 1977, all USTs were taken out of service.

Current Status of Tank Farms

According to Mr. Paul Kulpa of RIDEM, Tank Farms 4 and 5 were decommissioned with the demolition of all on-site USTs. Releases of OHM, mostly heavy oils, were uncovered during the decommissioning due to the disposal method of settled contaminants (tank sludge) in oil containing USTs and tank leakage. To prevent the buildup of tank sludge within the USTs, the sludge was removed via pumping to an on-site designated area for drying and incineration. Some designated areas had sand filters, which allowed the aqueous phase material to infiltrate into the ground, and retained oil contaminants at the surface, which sometimes was incinerated. The retained oil contaminants or dried at the designated areas were left in place without disposal. A possible transporter of OHM to the Rail Corridor from Tank Farm 5 is Gomes Brook which is located approximately 100 feet to the north at the nearest point to Tank Farm 5 and continues west through Rail Corridor to the west coast of Aquidneck Island.

UST leakage at Tank Farms 4 and 5 were uncovered during removal and excavation operations, when oil product was encountered in the soil. Most of the contaminated soil was removed, however, due to the location of the ASTs which were constructed on bedrock, the oil leakage which flowed through cracks and veins of the bedrock was not quantified and removed.

Tank Farms 1, 2, and 3 are functioning with stored materials ranging from heavy oil to jet fuel. A comprehensive site characterization at the three tank farms has not been initiated. Jet fuel release on the surface had occurred at Tank Farm 3. According to Mr. Kulpa releases of OHM in these Tank Farms are most likely. However, on August 1, 2002, Mr. Kulpa stated that these tanks had not been used for approximately 3 years.

Tank Farm 1 contains six 1.134 million gallon steel USTs, two 2.3 million gallon steel ASTs, an oil water separator, and two concrete USTs for groundwater and stormwater from Tank Farm 1 and 2. In the Initial Assessment Report, it states the following:

- Petroleum related compounds were confirmed to exist in the soils between Tanks 15 and 16 and southeast of Tank 12.
- Liquid petroleum was found a monitoring well near Tank 17. Based on gauging data and the influence of the ring drains, there appears to be limited potential for subsurface petroleum migration in this area.
- The analytical data indicates that the primary compounds of interest at Tank Farm 1 are benzene, toluene, ethylbenzene, and xylenes ("BTEX").

[7] Typical construction of the storage tanks consisted of stripping the soil overburden bedrock, and then blasting and excavating between 10 and 30 feet of bedrock to create a steep walled bedrock "socket" in which the tank was built or stop excavation at the bedrock surface. The tank bottom and walls were cast in the bedrock socket or on the bedrock surface with reinforced concrete. Once the bottom and walls were completed, the annular space between the tank walls and bedrock was backfilled with crushed bedrock and other local materials. The tank roof was also completed with the cast-in-place reinforced concrete, 12-inch nominal, which was buried under four feet of backfill materials.

Based on the Initial Assessment of Tank 70 of Tank Farm 3, petroleum seepage occurred at the Tank 70. The data collected suggests that there have been minor impacts to soil and groundwater in the area of investigation.

Mr. Kulpa mentioned that a main pipeline, which connects all the tank farms, is situated on the east side and along Burma Road. The pipeline crosses Burma Road and Railroad tracks to refueling points along the western coast of Aquidneck Island. There was evidence that pipeline have leakage.

Mr. Kulpa mentioned that the concrete vaults which house the valves have floor drains, which he has no information where they are connected.

Currently, free oil product was uncovered at the Midway pump house. Transformers were observed by Mr. Kulpa to be south and adjacent to the Midway pump house.

Derektor Shipyard underwent a PCB cleanup with the work described in the closure report. Additional releases of OHM, gasoline, were uncovered during the cleanup work, which is believed to be from the upgradient gas station.

4.5.4.2.4 State Spill Sites

The discussion of the State spill sites is divided into two sub-sections, which differentiate the state spill sites located on private properties and the Federal Defense Department property.

4.5.4.2.4.1 State spill sites LOCATED ON PRIVATE PROPERTIES

Berger reviewed data obtained from RIDEM's State Spill Inventory for listings of spill sites deemed to lie within 400 feet offset from the center line of the of rail corridor. Review of the spill sites (May 9, 2002), revealed one spill site on private property.

According to the letter of Lincoln Environmental, Inc. (May 18, 1994), an estimated volume of 40 to 50 gallons of no. 2 fuel oil was released to the basement of the residence, 33 State Avenue, Tiverton, Rhode Island, during a fuel delivery by Rite Oil Co., which recovered the fuel into a 275 gallon tank. Residual fuel impacted materials stored in the basement and seeped partially into the concrete floor.

On April 8, 1994, seven test holes were excavated beneath the concrete floor to assess the impact to underlying soil, according to Lincoln Environmental, Inc. (June 6, 1994). Based on the results of the TPH analyses, Lincoln Environmental, Inc. recommended no further excavation. A follow up letter by Lincoln Environmental, Inc. (June 20, 1994) stated that Lincoln Environmental, Inc. met with RIDEM representative to inspect the site condition. It was the understanding of Lincoln Environmental, Inc. that no further action is required by RIDEM.

Based on the Lincoln Environmental letter (June 20, 1994) this site does not appear to pose a REC with respect to the rail corridor.

4.5.4.2.5 State Hazardous Waste Site Database (Including Equivalent NPL and CERCLIS Sites)

Berger reviewed data obtained from RIDEM's SHWS inventory for listings of SHWS deemed to lie within 400-foot offset from the rail corridor. A search of the November 12, 2001 SHWS list revealed no listings.

The results of the reviews of the State equivalent of the CERCLIS sites are discussed in Subsections as follows:

Site	Subsection
• Melville North Landfill, sludge drying bed, Portsmouth, RI;	4.4.5

- McAllister Point Landfill, Middletown, RI; 4.4.5
- Derektor Shipyard, Coddington Cove, Middletown, RI; 4.4.5
- Naval Undersea Warfare Center ("NUWC") Disposal Area, Middletown, RI; and 4.4.5
- U-Haul Facility, 111 Connell Highway, Newport, RI. 4.4.5

Berger is currently reviewing location information with regard to U.S. Navy sites within the rail corridor.

4.5.5 Site Inspection

Berger conducted visual inspections of the rail corridor and Station locations to collect information that would identify RECs. The inspection required six days to cover the entire 15.8 miles of the rail corridor. The segments inspected and associated dates are shown in Table 4-3.

Table 4-3
Inspection Schedule

Segment	Inspection Date	Town	Segment Limits (including Station)	Mileposts
1	12/10/01	Tiverton	Massachusetts State Line to Swing Bridge (Tiverton Station)	15.8 to 13.1
2	12/11/01	Portsmouth	Swing Bridge to Boyd's Marsh (Anthony Road Station)	13.0 to 11.3
3	1/23/02	Portsmouth	Boyd's Marsh to Willow Lane (Mount Hope Station)	11.3 to 9.3
4	1/24/02	Portsmouth	Willow Lane to Melville (Melville Station)	9.3 to 7.1
5	1/25/02	Newport	Admiral Kalbfus Road to Newport Station (Newport Station)	0.0 to 0.9
6*	3/28/02	Portsmouth, Middletown, and Newport	Melville to Admiral Kalbfus Road (CCRI Station)	7.1 to 0.9

*Navy property (permission to access the railroad right-of-way was required.)

Starting from the northern tip in Tiverton (milepost 15.8), Berger inspected the rail corridor by walking along and in between the rails to the end of the rail corridor in Newport (milepost 0.0). Depending on the density of the plant growth and elevation of the rails, areas forty feet and beyond on either side of the rails were accessible to visual observations. Once important evidence was identified, Berger recorded the location using a global positioning system ("GPS") receiver and on aerial photographs. Berger also took representative photographs of the evidence. Appendix B contains photographs taken at the rail corridor during inspections.

In general, Berger observed dark stains in between the rails, which is typical throughout the rail corridor (Photograph 3-2).

The site inspection revealed the information summarized in the following bulleted lists.

Segment 1
Berger initiated the inspection at the point on the rail corridor which coincided with the Massachusetts and Rhode Island State Border and proceeded south to the railroad swing bridge.
Berger concluded the inspection of Segment 1 at the swing bridge east abutment or milepost 13.1.

- At the Massachusetts and Rhode Island State Border, Berger observed a tank farm (Inland Fuel Terminals, Inc., 25 State Ave., Tiverton, RI) on the west side of the rails, which consisted of five high-capacity ASTs that were adjacent to the west side of the rail corridor. No evidence of OHM spills that impacted the rail corridor was observed.

- At milepost 15.4 (rail corridor adjacent to the corner of Judson Street and Bay Street), Berger observed household solid waste on both sides of the rail corridor, which consisted of wood furniture, a refrigerator, plastic sheeting, and containers. No evidence of OHM spills that impacted the rail corridor was observed.

- At milepost 13.8 (Carey Lane intersection), Berger observed a large open area (approximately 80 acres) adjacent to the east side of the rail corridor. In comparison to surrounding undeveloped areas, no major vegetative growth was observed in the open area. According to the USGS Quadrangle map, the area was occupied by a tank farm with ASTs. No evidence of OHM spills that impacted the rail corridor and Tiverton Station location was observed. However, the area was low and could be in the flood zone and coastal wetland resource area.

- At milepost 13.6, Berger was prevented from proceeding south due to very dense vegetation growth. The inspection was reestablished at milepost 13.2; therefore, the segment of the rail corridor between mileposts 13.2 and 13.6 was not inspected.

- At the swing bridge east embankment, Berger observed high-capacity transmission cables and towers over the rail corridor. However, no transformers were observed with the electrical towers. No evidence of OHM spills that impacted the rail corridor was observed.

Segment 2
At the west abutment of the swing bridge, milepost 13.0, Berger proceeded south to Boyd's Marsh (milepost 11.3).

- Berger observed high-capacity transmission cables and towers located adjacent to the north side of the rail corridor for the majority of Segment 2. However, no transformers were observed with the electrical towers. No evidence of OHM was observed for this segment.

- At milepost 12.7, No evidence of OHM was observed at the Anthony Road Station location.

Segment 3
- From Boyd's Marsh, milepost 11.3, Berger advanced south to the Willow Lane intersection (milepost 9.3).

- At milepost 10.8, approximately 150 feet north of the Mount Hope Bridge, Berger observed some household solid waste, which consisted of window frames, storm windows, and plywood. The solid waste appeared to be located within the rail corridor. No evidence of OHM spills that impacted the rail corridor was observed.

- At milepost 10.0, no evidence of OHM spills was observed at the Mount Hope Station location, which is located north and east of the Mount Hope Maritime Terminal.

- At milepost 9.84, just south of the Mount Hope Maritime Terminal, Berger observed abandoned rail cars on the west side of the rails. Due to dense growth, areas surrounding and below the rail cars was unobservable (Photograph 3-1).
- At milepost 9.4, Berger observed an abandoned plastic barrel on its side. No evidence of OHM spills that impacted the rail corridor was observed (Photograph 3-3).

Segment 4
From the Willow Lane intersection (milepost 9.3), Berger continued south to Melville (milepost 7.1).

- At the intersection of Willow Lane, Berger observed a tall silo (approximately 5 stories) next to an industrial building formerly known as Kaiser and adjacent to the west side of the rail corridor (Photographs 4-1 and 4-2). No signs of OHM spills were observed around the silo.

- At mileposts 7.4 and 7.1, Berger observed commercial solid waste, oil sheen, unknown orange powdery substance, and turbid standing water in the ditch area (approximately 20 feet in length and 3 inches in depth), in the vicinity of Melville (Photographs 4-3 to 4-6).

- At the dinner train staging area in Melville (milepost 7.1), Berger observed junk metal parts, batteries (associated with the rail cars), electrical equipment parts, used oil drums, and new 5-gallon engine lubricant oil containers. Also, Berger observed a concrete utility vault which houses control valves for the ASTs located up-gradient, which was not accessible for inspection (Photographs 4-7 to 4-12). No evidence of OHM spills was observed at the Melville Station location, which is located east of the track and staging area, where the area was dense with vegetative growth.

Segment 5
At the intersection of Admiral Kalbfus Road, milepost 0.9, Berger proceeded to the south end (approximately milepost 0.0) of the rail corridor.

- At milepost 0.9, several 55-gallon drums located adjacent to the west side of the rail corridor were observed. The drums may belong to the local businesses. In addition, Berger observed several overturned plastic barrels. The plastic barrels may be part of the lobster operation in the adjacent building (Photographs 5-1 and 5-2). No evidence of OHM spills that impacted the rail corridor was observed.

- At milepost 0.8, Berger observed an abandoned truck engine (Photograph 5-3).

- At milepost 0.0, no evidence of OHM was observed at the Newport Station Location.

Segment 6
The inspection of this segment was within Navy property and began in Melville (milepost 7.1), finally terminating at milepost 0.9 (intersection of Admiral Kalbfus Road).

- In Melville (milepost 7.1), Berger observed solid waste in the southwest corner of the intersection of Stringham Road, which consisted of an abandoned small volume gasoline container, an empty 55-gallon drum, a 3-gallon rusty propane tank, a plastic barrel on its side, and general rubbish (Photographs 6-1 to 6-4).

- At milepost 4.5 or adjacent to Green Lane, Berger observed a utility underground vault and aboveground structure with an AST. The utility housing was located within the rail corridor, or approximately 20 feet east of the rails (Photograph 6-6).

- At mileposts 4.0 to 3.7, Berger observed a recently capped landfill adjacent to the west side of the rail corridor. No OHM was observed from the landfill (Photograph 6-7).

- At milepost 3.3, Berger observed a typical concrete box located approximately 20 feet east of the rails. The concrete box was covered; however, Berger observed other opened concrete boxes, which were storing batteries and electrical equipment. No evidence of OHM spills that impacted the rail corridor was observed (Photograph 6-5).

- At milepost 2.4, a solidified mass of molten metal (approximately 10 feet by 5 feet) was observed on the west side of the rails (Photograph 6-8).

- At milepost 2.2, stained grass below the aboveground piping system associated with the Boiler Plant (Navy Building No. 7) was observed, which could be a result of pipe leaks (Photographs 6-9 and 6-10).

- At milepost 1.9, Berger observed an abandoned household AST (approximately 100 gallons), located 10 feet west of the rail corridor (Photograph 6-11). No evidence of OHM spills that impacted the rail corridor was observed.

- At milepost 1.72, no evidence of OHM was observed at the CCRI Station location.

- At milepost 1.1, Berger observed solid waste west of the rail corridor and in the wetland area, consisting of a plastic "Dunkin Donuts" sign and large rubber tire. No evidence of OHM spills that impacted the rail corridor was observed (Photograph 6-12).

The following items represent RECs, as the result of the site inspection:

- **Typical dark stains along the Rail Corridor**
  Berger observed a dark stain in between the rails, which is typical throughout the rail corridor. This condition represent a REC, due to possible release of OHM.

- **Rail Corridor adjacent to the corner of Judson Street and Bay Street (milepost 15.4)**
  Berger observed household solid waste on both sides of the rail corridor, which consisted of wood furniture, a refrigerator, plastic sheeting, and containers. This area represents REC, due to possible release of OHM.

- **Rail Corridor adjacent to Carey Lane intersection (milepost 13.8)**
  Berger observed a large open area (approximately 80 acres) adjacent to the east side of the rail corridor. In comparison to surrounding undeveloped areas, no major vegetative or plant growth was observed in the open area. According to the USGS Quadrangle map, the area was occupied by a tank farm with ASTs. This area represents REC, due to possible release of OHM from past operations of the tank farm.

- **Rail Corridor at milepost 13.6**
  Berger was prevented from proceeding south due to very dense vegetation growth. The inspection was reestablished at milepost 13.2; therefore, the segment of the rail corridor between mileposts 13.2 and 13.6 was not inspected. This area represents REC, due to possible release of OHM.

- **Rail Corridor at milepost 9.84**
  The area of concern is located just south of the Mount Hope Maritime Terminal, Berger observed abandoned rail cars on the west side of the rails. This area represents REC, due to possible release of OHM from abandoned rail equipment.

- **Rail Corridor at the intersection of Willow Lane (milepost 9.3)**
  Berger observed tall silos next to an industrial building formerly known as Keiser and adjacent to the west side of the rail corridor. Although, no visual signs of OHM spills were observed around the silo, more information is needed to determine whether any OHM releases occurred.

- **Rail Corridor at mileposts 7.4 and 7.1**
  Berger observed commercial solid waste, oil sheen, unknown orange powdery substance, and turbid standing water in the ditch area, in the vicinity of Melville. The observation indicated that a release of OHM occurred.

- **Rail Corridor at milepost 7.1**
  In Melville, Berger observed solid waste in the southwest corner of the intersection of Stringham Road, which consisted of an abandoned small volume gasoline container, an empty 55-gallon drum, a small-volume, rusty propane tank, a plastic barrel on its side, and general rubbish. This area represents REC, due to possible release of OHM from empty containers.

- **Rail Corridor at the dinner train staging area in Melville (milepost 7.1)** Berger observed junk metal parts, batteries, electrical equipment parts, used oil drums, and new oil containers. Also, Berger observed a concrete utility vault which houses control valves for the oil tanks located up-gradient. Berger did not gain access to the vault for inspection. This area represents REC, due to possible release of OHM from utility vault, equipment, and storage containers.

- **Rail Corridor adjacent to Green Lane (milepost 4.5)**
  Berger observed a utility underground vault and aboveground structure with an AST. The utility housing was located within the rail corridor, or approximately 20 feet east of the rails. This area represents REC, due to lack of information regarding the operation of the equipment.

- **Rail Corridor at milepost 2.2**
  Stained grass with the rail corridor below the aboveground piping system associated with the Boiler Plant (Building No. 7) was observed, which could be a result of pipe leaks. This area represents REC, due to lack of information regarding the leaked material.

- **Rail Corridor at milepost 1.9**
  Berger observed an abandoned AST, located 10 feet west of the rail corridor. This area represents REC, due to possible release of OHM.

- **Rail Corridor at milepost 0.8**
  Berger observed a large abandoned engine located within the railroad ROW and east side of the rail corridor. This area represents REC, due to possible release of OHM.

4.5.6 Business Environmental Risks

The rail corridor has a general and specific Business Environment Risk[8] ("BER") associated deteriorating overhead bridges and asbestos containing material ("ACM"). During the site inspection, Berger noticed that, typically, overhead bridges exhibited deteriorated wood beams and decks, which could generate falling

[8] ASTM Standard E1527 defines "business environmental risk" as "a risk which can have a material environment or environmentally-driven impact on the business associated with the current or planned use of a parcel of commercial real estate, not necessarily limited to those environmental issues required to be investigated in this practice."

debris. For the specific BER, according to Site Assessment and Screening Evaluation Report for the Derektor Shipyard, ACM was found to be prevalent at the facility.

4.5.7 Conclusions

On the basis of the ESA findings discussed in the preceding sections, Berger has identified properties of concern along the rail corridor as follows (see Figures 1-T through 14-N):

1. **Rail Corridor at milepost 2.2**
   Stained grass within the rail corridor below the aboveground piping system associated with the Boiler Plant (Building No. 7) of the Navy facility was observed, which could be a result of pipe leaks.

2. **Derektor Shipyard, Coddington Cove, Middletown, RI (milepost 2.4)**
   Based on the upgradient location, proximity of the shipyard, and contamination of: BTEX compounds, solvents, waste oil, spent sand blast grit, abandoned 55-gallon drums, undocumented underground storage tanks ("USTs") and ASTs, and other waste solids and liquids, this site may pose a threat to the rail corridor.

3. **Derektor Shipyard, Coddington Cove, Middletown, RI (milepost 2.4)**
   Derektor Shipyard underwent a PCB cleanup with the work described in the closure report. Additional releases of OHM, gasoline, were uncovered during the cleanup work, which is believed to be from the upgradient gas station.

4. **Naval Undersea Warfare Center ("NUWC") Disposal Area, Middletown, RI (milepost 3.4)**
   Based on the upgradient location, proximity of the NUWC Disposal Area, and the petroleum contamination currently present on this site but that no remediation is currently taking place, this site may pose a threat to the rail corridor.

5. **McAllister Point Landfill, Middletown, RI (milepost 3.8)**
   Based on the proximity of the landfill area and contamination of BTEX compounds, acids, waste oil, PCBs, pesticides, carcinogenic Polynuclear Aromatic Hydrocarbons ("PAHs"), and metals. this site may pose a threat to the rail corridor.

6. **U.S. Navy Fuel Line, Middletown & Portsmouth, RI (mileposts 4.1 to 7.1)**
   A main pipeline, which connects all the tank farms, is situated on the east side and along Burma Road. The pipeline crosses Burma Road and Railroad tracks to refueling points along the western coast of Aquidneck Island. There was evidence that pipeline have leakage.

7. **Tank Farms 4 & 5, Middletown & Portsmouth, RI (mileposts 4.1 & 5.6)**
   Although the USTs were demolished at Tank Farms 4 and 5, no remedial actions were implemented to address the bedrock fuel leakage.

8. **Rail Corridor adjacent to Green Lane (milepost 4.5, Middletown)**
   Berger observed a utility underground vault and aboveground structure with an AST. The utility housing was located within the rail corridor, or approximately 20 feet east of the rails.

9. **Midway Pump House (milepost 4.67, Middletown)**
   Free oil product was uncovered at the Midway pump house, located east of the rail corridor. Transformers were observed by Mr. Kulpa to be south and adjacent to the Midway pump house.

10. **Tank Farms 1, 2, & 3, Portsmouth, RI (mileposts 6.0, 7.0, and 7.1)**

Tank Farms 1, 2, and 3 are functioning with stored materials ranging from heavy oil to jet fuel. A comprehensive site characterization at the three tank farms has not been initiated. According to Mr. Kulpa releases of OHM in these Tank Farms are most likely. However, on August 1, 2002, Mr. Kulpa stated that these tanks had not been used for approximately 3 years.

11. **Melville North Landfill, Portsmouth, RI (milepost 6.8)** [9]
Based on the proximity of the Landfill area and contamination of benzene, toluene, ethyl benzene, and xylene ("BTEX") compounds, acids, waste oil, polychlorinated biphenyls ("PCBs"), pesticides, and metals. this site may pose a threat to the rail corridor.

12. **Melville North Landfill, sludge drying bed, Portsmouth, RI (milepost 6.8)**[9]
Based on the proximity of the Sludge Drying Bed area and waste oil contamination, this site may pose a threat to the rail corridor.

13. **Melville North Landfill, Structure 214, Portsmouth, RI (milepost 6.9)**[9]
Based on the proximity of the Structure 214, reported waste oil contamination, and no information on remediation, this site may pose a threat to the rail corridor.

14. **Rail Corridor at the dinner train staging area in Melville (milepost 7.1)**
Berger observed junk metal parts, batteries, electrical equipment parts, used oil drums, and new oil containers. Also, Berger observed a concrete utility vault which houses control valves for the oil tanks located up-gradient. Berger did not gain access to the vault for inspection. However, the vault should be thoroughly inspected for oil leakage.

15. **Rail Corridor at milepost 7.1**
In Melville, Berger observed solid waste in the southwest corner of the intersection of Stringham Road, which consisted of an abandoned small volume gasoline container, an empty 55-gallon drum, a small-volume, rusty propane tank, a plastic barrel on its side, and general rubbish.

16. **Rail Corridor at mileposts 7.4 and 7.1**
Berger observed commercial solid waste, oil sheen, unknown orange powdery substance, and turbid standing water in the ditch area, in the vicinity of Melville.

17. **Rail Corridor at the intersection of Willow Lane (milepost 9.3)**
Berger observed tall silos next to an industrial building formerly known as Keiser and adjacent to the west side of the rail corridor. No signs of oil or hazardous materials ("OHM") spills were observed around the silo.

18. **Rail Corridor at milepost 9.84**
The area of concern is located just south of the Mount Hope Maritime Terminal, Berger observed abandoned rail cars on the west side of the rails.

19. **Rail Corridor at milepost 10.4 (Portsmouth)**
Berger observed a dark stain in between the rails, which is typical throughout the rail corridor.

20. **Rail Corridor at milepost 13.6**
Berger was prevented from proceeding south due to very dense vegetation growth. The inspection was reestablished at milepost 13.2; therefore, the segment of the rail corridor between mileposts 13.2 and 13.6 was not inspected.

[9] On August 1, 2002, Mr. Kulpa state that the report submitted by the Navy regarding the Melville North Landfill (Parcels 11, 12, and 13) had not yet been accepted to RIDEM. Therefore, this report reflects the most recent data on record.

21. Rail Corridor adjacent to Carey Lane intersection (milepost 13.8)
Berger observed a large open area (approximately 80 acres) adjacent to the east side of the rail corridor. In comparison to surrounding undeveloped areas, no major vegetative or plant growth was observed in the open area. According to the United States Geological Survey ("USGS") Quadrangle map, the area was occupied by a tank farm with aboveground storage tanks ("ASTs").

22. Rail Corridor adjacent to the corner of Judson Street and Bay Street (milepost 15.4, Tiverton)
Berger observed household solid waste on both sides of the rail corridor, which consisted of wood furniture, a refrigerator, plastic sheeting, and containers.

4.5.8 Recommendations

Berger recommends that, to evaluate potential exposure to pedestrians and bicyclists, a Phase II Environmental Site Assessment be conducted to evaluate surface and subsurface soil, which will consist of sampling for PAHs, VOCs, TPH, PCBs, DDT, and metals at Melville North Landfill, Melville Sludge Drying area, Melville Structure 214, McAllister Landfill, and Derektor Shipyard. In addition, samples should be taken at Rail Corridor adjacent to Tank Farms 1 through 5, main fuel line crossing points, and Midway pump house for analyses of VOCs, TPH, and SVOCs. Inspection for OHM releases at the concrete vault, dinner train staging area in Melville (milepost 7.1), should be conducted, Berger did not gain access to the vault for inspection. Other concrete vaults housing fuel valves should also be thoroughly inspected for OHM releases.

4.6 Air Quality Considerations

Development of either new rail service or the bike path or both aspects of the feasibility study will have some impact on air quality in the area. The requirements of the Federal Clean Air Act (CAA) of 1970, as amended, and state regulations direct that transportation plans, projects and improvement programs not do the following:

- Cause or contribute to any new violation of the National Ambient Air quality Standard (NAAQS);
- Increase the frequency or severity of any existing violations of the NAAQS, or
- Delay the timely attainment of the NAAQS.

Under CAA and its amendments, the EPA has the ultimate authority for protecting ambient air quality, and has issued NAAQS for six criteria pollutants; carbon monoxide, sulfur dioxide, particulate pollution less than or equal to 10 micrometers in diameter, ozone, nitrogen dioxide and lead. The CAA directs that states and local governments have a primary responsibility for air pollution prevention and control, and authorizes that they may adopt standards and enforce ambient air quality standards (AAQS) more stringent than the NAAQS. Rhode Island has adopted the NAAQS. Areas that do not meet the NAAQS are classified as non-attainment areas.

All counties within Rhode Island are classified by the EPA as being in non-attainment status for the NAAQS pollutant, ozone, with a classification of serious. The State of Rhode Island in conformance with CAA requirements has developed and submitted a State Implementation Plan (SIP) to the EPA, which describes how the State will attain and maintain air quality standards in non-attainment areas. The Rhode Island Department of Environmental Management is the state agency responsible for implementing the SIP.

Rail Service alternatives are estimated to result in some reduction of automobile traffic (See Section 1.) according to the ridership projections. Any increase in emissions resulting from introduction of rail service would be compared to projected reductions form decreases in automobile trips on the study area.

Rail service alternatives propose using a Diesel Multiple Unit (DMU) for all service on Aquidneck Island. The rail vehicle is a self-propelled car powered by a diesel engine with a power rating in the range of 600 - 1000 hp. Please see Section 2 for further details on car capacity and specification. New diesel engine

developments for DMU's reportedly meets or exceeds EPA emission standards for mobile sources (Source: Colorado Railcar Engine Specifications, Colorado). These are essentially large, truck engines, and the exhaust venting is directed up from the roof. According to a report by the National Cooperative Highway research Program and the Transit Cooperative Research Program (Project A-17, 1996), DMUs in the study were built to European emission standards, which are more stringent than those of the United States.

Should one of the new rail service alternatives be implemented, as part of a larger study, most probably an EIS, additional studies would need to be conducted to demonstrate that the new rail service would not result in exceeding NAAQS criteria.

Required studies would involve:

- Establishing a scope for an air quality analysis with both a mesoscale study and a microscale study;
- Meetings with RIDEM to review the scope and provide input;
- Implementation of the analysis, and review and approval by RIDEM.

There would also be a series of public meetings and workshops to solicit comments and present the results of the findings of the analysis.

Development of a bike path facility would have no detrimental impact on AAQ in the area, and would in all likelihood result in some reduction of automobile traffic, having a positive affect on local air quality.

4.7 Noise Considerations

The potential for noise impacts resulting from new rail service exists and will need further study if any rail alternatives are to be implemented. The presence of many neighborhoods in close proximity, and in some locations adjacent, to the ROW increases the possibility for introduction of increased noise levels. Noise impacts may result from train engine operation; stopping, starting and boarding at station locations; track noise from contact with the wheels, and from required crossing whistles and other audible warning signals. There are approximately 28 authorized rail-crossing locations along the ROW. The Federal Rail Administration has very stringent requirements for restricting, controlling and warning at rail crossing locations.

Noise impacts are regulated by federal, state and local governments. The Noise Control Act (NCA) of 1972 and amended by the Quiet Communities Act of 1978, provides the federal framework for federal funding and actions, as well as community noise ordinances and state regulations. The FHWA has noise criteria as defined in 23 CFR 772. Newport and the town of Middletown both have daytime and nighttime noise ordinances and standards. The State has noise standards for open water areas, which will also have to be addressed as the rail line travels next to the water for much of its length.

As part of a larger study effort, implementation of any of the rail service alternatives will require that a noise abatement study be conducted. This effort will include baseline noise monitoring at night and during the day at specific locations identified and meeting criteria as sensitive receptors, to determine day-night average sound levels. Noise levels from introduction of rail service, with its associated noise producing elements, in the area will be used to assess how much sound will increase at the receptors. An analysis will be conducted to determine if any, and, what types of impacts may occur, their magnitude and development of mitigation measures to reduce any projected noise impacts.

Development of the bike path facility is not expected to contribute to noise levels in the ROW area and the surrounding neighborhoods. Local concerns may have to be addressed as to the degree of noise increase form such a recreational facility. This may include some noise studies, as well as providing information on how other neighborhoods and communities have experienced bicycle path facilities. In many communities across

the country they have been found to actually increase property values in nearby homes, as well as contribute to a sense of community identity, and serve as family- oriented destinations.

4.8 Vegetation / Plant Communities

During wetland and site assessment field investigations observations were also noted on the presence of wildlife and the habitats within the rail corridor. Aerial photographs used for the project mapping tasks (see Figures 1T through 14-N) graphically depict the changes in landuse and the patterns of development, where native plant communities have given way to construction activities.

Communication with the Rhode Island Department of Environmental Management, Natural Heritage Program indicates that there are no unique or special interest, plant communities within the rail study corridor, nor are there any known sites of endangered or threatened plant or animal species present according to their records. The Natural Heritage Program is the state repository for information related to state and federal protected plant and animal species. The Program coordinates its findings and activities with the US Fish and Wildlife Service for implementation of requirements and regulations under the Endangered Species Act.

Much of the rail corridor within the city of Newport is adjacent to very heavily developed commercial and residential land use. Urban land uses with associated pavement dominate the landscape for Newport and the Navy Base. Stands of undisturbed native vegetation are hard to find, with invasive plant species such as rugosa rose and Phragmites reed common in the area. Throughout the Newport Navy Base, industrial, transportation, education, and support and service facilities dominate the landscape. Natural vegetation areas with old field and forested successional plant communities become more prevalent in Middletown and along the rail corridor north to Portsmouth. The Town of Portsmouth has the longest rail corridor segment for the project, with approximately 8 miles out of the 15.84-mile total, including the Tiverton Segment, which ends at the Massachusetts State line. Plant communities along the Tiverton Rail Segment also show the effects of former industrial activities and the various housing booms, with remnant second growth hardwood forested areas and successional shrub communities broken up by large residential tracts and industrial land uses.

The dominant land use on the Island for over two hundred years was agriculture, with the exception of the City of Newport which has historically had relatively dense residential use over that same period as it was the center of government and commerce, as well as a thriving seaport. Throughout Middletown and Portsmouth as agricultural lands have been taken out of production and the lands allowed to revegetate, successional plant communities have established themselves.

Herbaceous and woody shrub plant species, and young tree saplings dominate old field successional communities. Dominant plants observed in these areas include: wild rose (*Rosa* spp), bittersweet (*Celastrus scandens*), bullbriar (*Smilax rotundifolia*), poison ivy (*Toxicodendron radicans*), rugosa rose (*Rosa rugusa*), pokeweed (*Phytolacca americana*), staghorn sumac (*Rhus typhina*), black cherry (*Prunus serotina*), little bluestem grass (*Andropogon scoparius*), goldenrod (*Solidago* spp.) and other grasses.

Forest communities consist primarily of two types of hardwood forests, which are characterized by their topographic position, hydrography and dominant plant species. Upland mesic hardwood forests are dominated by red oak (*Quercus rubra*), white oak (*Quercus alba*), sassafras (*Sassafras albidum*), ash (*Fraxinus* spp.) and hickory (*Carya* spp.) tree species; understory vegetation consists of shrubs and herbaceous plants such as wild grape (*Vitus* spp.), aster (*Aster* spp.), bullbriar, and sedge (*Carex* spp.)

Common tree species in the hydric lowland forests consisting of red maple, (*Acer rubrum*), swamp white oak (*Quercus bicolor*), green ash (*Fraxinus pennsylvanica*), and sassafras. Shrub and herbaceous plants in the understory typical to this plant community include: northern arrow wood (*Viburnum recognitum*), highbush blueberry (*Vaccinium corymbosum*), white alder (*Clethra alnifolia*), speckled alder (*Alnus rugosa*) blackberry (*Rubus* spp.) and skunk cabbage (*Symplocarpus foetidus*).

Freshwater marsh and saltmarsh areas are also present in the vicinity of the rail corridor but occupy a smaller land area. The ROW passes through some wooded swamps with some shrub swamp and freshwater marsh areas. Some of the largest freshwater wetlands are the wooded swamp complexes associated with Gomes and Normans Brooks, and the Lawton Reservoir Swamp and Stream which are located on the other side of Burma Road from the rail corridor. For more detailed information on wetland habitats please see Section 4.1.

There are only very minor impacts expected to plant communities on either Aquidneck Island or Tiverton resulting from development of rail alternatives or the bike path. However, the bike path alignment as proposed, is to cross two areas of sensitive saltmarsh and beach, one at Boyd's Marsh and the other at Starwood in Tiverton. Both sites are protected under the Federal Coastal Zone Management Act and regulated by the Rhode Island Coastal Resources Management Council. Section 4.1 provides detailed information on potential impacts.

4.9 Historic and Archaeological Resources

The development of rail service alternatives and the bike path will require review under Section 106 of the National Historic Preservation Act of 1966, as amended and Section 4(f) of the Department of Transportation Act of 1966 concerning the identification of and assessment of potential impacts to National Register historic resources and significant, publicly-owned parks, recreation areas, wetlands and wildlife refuges. The rail corridor passes through or in the vicinity of a number of above-ground National Register listed, eligible or potentially-eligible historic properties. Construction excavation for rail services and the bike path may have the potential to affect previously unidentified significant archaeological resources. During the NEPA, Section 106 and Section 4(f) environmental permitting process for this project, appropriate coordination with the Rhode Island Historical Preservation & Heritage Commission (RIHPHC) and other consulting/additional consulting parties will be undertaken to identify all significant Sections 106/4(f) resources, assess potential impacts and develop alternatives and agreements to avoid, minimize or mitigate any adverse effects to those resources.

4.10 Aesthetics and Visual Impacts

From the inception of the project, the rail improvements and bicycle path have been conceived of as a single entity within the rail corridor. As shown in Appendix A illustrations: Opportunities and Constraints Plan Figures 3.1 –3.10 and Concept Plans Figures 3.11-3.17, the design concept integrates the operation and appearance of the two facilities at stations, parking lots, grade-crossings, and along the corridor. Therefore, many of the comments about the visual character of the bicycle path apply to the rail line and vice-versa. However, since the two facilities may be built in phases and/or at different times, the discussion addresses them separately.

General Character of the Bicycle Path

The paved bicycle path adjacent to the railway would be typical of a rails-with-trails project. The 82.5 foot wide (average) railroad right-of-way accommodates the bicycle path, fencing, and planting necessary to create a safe and continuous recreational corridor. Proposed landscaping would include a narrow grass strip on either side of the bicycle path and a native meadow consisting of warm and cool season grasses and wildflowers. A generous 12'-wide paved bicycle path promotes both recreational and commuter use. In more sensitive wetland or scenic areas, a 12'-wide boardwalk would allow riders to experience the area's natural resources and beauty more directly than from the rail embankment.

General Character of the Railroad Infrastructure

The reconstructed rail infrastructure would look very similar to existing facilities. There would be up to five new stations: Tiverton, Anthony Road, Mt. Hope Terminal, Melville, and CCRI/Ranger Road. They would consist of one or two 150' platforms with simple shed roofs and associated surface parking, in the small scale, unobstrusive visual character of many suburban railroad stations. The Newport Station would be expanded, but its historic features would be retained. New grade-crossings would be visually similar to existing signalized facilities. There would be fewer sidings since only two are needed to accommodate the potential

range of passenger services; both have scenic views of the Bay. Service and light maintenance facilities proposed for the Melville area would occur within the existing industrial area.

4.10.1 View from the Corridor

Although they generally follow the same path, the visual/aesthetic experience of bicycle riders and train passengers would be slightly different. Bicycle riders would experience a variety of views and educational opportunities as they follow the path. Train riders would see much the same views, but from a greater distance and, typically, from a slighter higher elevation because the trains run on embankment in many areas. In addition to not being outdoors and going substantially faster, a passenger would generally sense rather than experience the same features of the landscape as the bicycle rider. The major differences in the visual experience of the two different kinds of riders are addressed separately by major landscape division.

Tiverton

Bicyclists: The bicycle path would begin at the state line and continues south adjacent to an oil tank facility. A combination of fencing and planting would be used to screen the lower portion of the tanks and containment dikes. A trailhead connection to the adjacent neighborhood would be proposed at Hooper Street, allowing users to safely enter or exit the path. A proposed rest area with interpretive features and great water views would be proposed for historic Borden's Wharf. South of Horizon Drive the plant community changes to mature woodland on both sides, creating an enclosed corridor which is relatively uncommon along to the rest of the bicycle path. Adjacent to the Colony Terrace residential area, the bicycle path would be elevated above the railway, creating separation and visual connection to the Sakonnet River. Near the proposed Starwood site, the path could stay in the r.o.w. or become a boardwalk meandering away from the railway, "floating" above the tidal marshes before returning to the Tiverton Station area.

Between Tiverton Station and the Sakonnet Bridge, the bicycle path would become part of the scenic Poplar Avenue and Riverside Drives. A 4-foot minimum one-way lane with stabilized shoulder would occur on either side of the road. To maximize continuity and scenic value, the path could run the entire length of Riverside Drive. A connection to the proposed Sakonnet River Highway Bridge would have to be made when plans for the bridge are advanced.

Railroad Passengers: In addition to the generic differences described above, a train passenger would not experience the water's edge directly. However, the crossing of the Sakonnet River on a railroad bridge would be a unique experience.

Sakonnet River to Melville (Portsmouth)

Bicyclists: An overlook on the Portsmouth side of the Sakonnet railroad bridge would be a site to interpret the many historical types of infrastructure used to connect Aquidneck Island to the mainland. West of the overlook the path would take an alternate route on adjacent state property through upland meadow.

Riding south, the bicyclist would see views of Mt. Hope Bay. A boardwalk and overlook at the newly restored Boyd's Marsh would educate users on the significance of a tidal marsh ecosystem. A spur off the trail at the historic Bristol Ferry Landing could provide a rest area near the base of the Mt. Hope Bridge. At the Mt. Hope Station, the user would experience the open-field agrarian landscape reminiscent of a mostly bygone era on Aquidneck Island.

A boardwalk section across Barker Brook would provide separation between the path and rail over a narrow bridge. As the corridor narrows and becomes steep, the path would rise in elevation west of the tracks providing commanding views of the bay. A signal and at-grade track crossing at Portsmouth Abbey would allow the path to shift from the west side to east side of the track. A reconstructed underpass stairway at the St. Philomena School would allow students to access the shoreline while providing a clear and safe path crossing.

Approaching Melville, a combination of timber fencing and plantings are proposed to screen some of the industrial "back yards" encountered in this working landscape. A more manicured, park-like setting at Melville Station would include shade trees, groundcover, and lawn. After the Stringham Road crossing, the path leaves the corridor and follows Burma Road.

Railroad Passengers: In addition to the generic differences described earlier, a train passenger would view Boyd's marsh from above, and begin a long passage into a typical cross section with open western views towards the Bay. The eastern side of the rail alignment would consist of a succession of vegetated embankments with occasional views of open fields or residential areas.

Melville to Navy's Gate 17 along Burma Road (Portsmouth and Middletown)

Bicyclists: The Burma Road section would be a one-way bike lane on both sides. Although moderate traffic and relatively high vehicle speeds give it more of commuter character, this segment of the path offers outstanding views to the water along its entirety. Attractive views of Weaver Cove at the public boat launch would be accessible via the access drive. Screening from the bicycle path to the storage facility would be necessary just south of the Carr Point Recreation Area off of Burma Road. At Greene Lane in Middletown, a historic ferry landing would be highlighted through interpretive features.

The McAllister's Point landfill site would be an attractive expanse of open space along the bicycle path. A path system leading to the top would provide spectacular views across Narragansett Bay and the ability to picnic, rest, or fly a kite. Highlights along the remaining stretch of Burma Road would include many of the Navy's facilities, including the periscope station and decommissioned ships at anchor.

Railroad Passengers: The train passenger's experience in this section would be very similar to that in the previous section of the alignment.

Navy's Gate 17 to Gateway Center (Middletown and Newport)

Bicyclists: The bicycle path would deviate from the Navy secure area between Gate 17 and the CCRI Station. Although not the most direct route, path users would be able to get broader views of the Bay and pass through landscaped residential areas outside the Navy's secure area. A short ride along Coddington Highway would then return them to the corridor at the station.

Boardwalk and bicycle paths traverse a continuous commercial zone south of the CCRI Station. Where possible, screening through planting would help to break up large expanses of commercial areas. Large stands of common reed grass in this area support minimum diversity and increases the chance of uncontrolled fires.

In Newport, the existing bridge relic at Walnut Street would be an exceptional gateway. Special plantings, including a new shelter, provide the vertical elements would highlight the southern terminus at Poplar Street. The urban streetscape would contrast with the agrarian and suburban landscapes previously encountered and provide a transition into downtown Newport. Connections via on-road bicycle lanes into Newport currently exist.

Railroad Passengers: In addition to the generic differences described earlier, the view of train passengers going through the Navy's secure area would be constrained by high, opaque security fencing. After the secure area, passengers would have an open water view at Coddington Cove. The remainder of their visual experience of the surroundings would be very similar to that described for bicycle riders in this section.

4.10.2 View of the Bicycle Path and Rail Corridor

Historically, trains have used this corridor since the 1860s but frequent passage has been discontinued since the late 1970s. The biggest change from existing conditions would probably be associated with the frequency of train operations. Currently, during the tourist season, three trains a day ride the line between Newport and Melville at 10 mph or less. Off-season, the line is hardly ever used. The On-island shuttles and Fall River

shuttles would introduce trains moving a much higher speeds, up to 60 mph on open stretches, roughly every half hour for 13 hours a day. While the passage of a single car train would not obstruct views for very long, its frequency would change the semi-rural character that has developed since the ending of passenger and freight rail activities approximately thirty years ago.

For abutters, the view of and across the corridor would not change very much. Rail and bike fencing would be visually unobstrusive (e.g. black and without a top wire) and often hidden from view by topography or vegetation. The major visual difference would occur with the passage of a single-car train or bicycle riders.

The major aesthetic impact would be noise of higher speed trains and the relatively few locations where they and the bicycle path are in close proximity to residential areas or not distant enough or hidden from view. Noise impacts would have to be carefully addressed as described in Section 4.7 above. Mitigation measures, if any, that might address the change in character would have to be addressed in detail during an Environmental Impact Statement. Potential impacts and appropriateness of visual and/or sound screening should be addressed in the following areas:

Tiverton
Noise and visual effects should be investigated for two residential areas, which are roughly at-grade with the track: a) from the state line to Judson Street, and, b) between Summerfield Lane and Bismark Avenue.

Sakonnet River to Melville (Portsmouth)
Noise and visual effects should be investigated for two residential areas which are roughly at-grade with the track: a) from the southern edge of the Montaup Country Club to just north of Weyerhauser Road, and, b) roughly one block on either side of Willow Lane. While effects should be assessed, the recently constructed condominiums north of the Abbey School are aligned at right angles to the track and less likely to be noticeably affected by passage of the one-car trains.

Melville to Navy's Gate 17 along Burma Road (Portsmouth and Middletown)
Noise effects should be investigated for the Greene Lane Navy housing which is located on an embankment above the rail cut.

Navy's Gate 17 to Gateway Center (Middletown and Newport)
Noise and visual effects should be investigated for the housing project between Admiral Kalbfus Road and the Route 138 overpass as well as for the section of the Point neighborhood, which immediately fronts on the railroad right-of-way.

4.11 Land Use and Neighborhood Cohesion

Alternatives for use and preservation of the rail ROW may result in varying degrees of impacts to existing land use and neighborhoods in the project area. Development of new rail service along the rail line will reintroduce a transportation mode which has been absent on the Island for many years, and which, is unknown for many residents in the area. Likewise, construction of a bike path within and along the rail ROW will also introduce a new type of land use and transportation facility next to existing neighborhoods and communities.

Planning documents for Aquidneck Island including the West Side Mater Plan, West Side Transportation Guide Plan, and the three island-community comprehensive plans all recognize the potential of development of the rail corridor for rail or as a bike path. All the planning documents identify bike path development as a desirable objective. The West Side Master Plan (AIPC, 2000) and Transportation Guide Plan (AIPC, 2001), identifies the need to explore and possibly develop rail and other forms of transportation use within the ROW to meet projected future needs for transportation and recreation on Aquidneck Island.

The potential exists in some locations along the corridor for conflicts between existing land uses and development of new rail service alternatives or a bike path. This section of the report identifies areas of potential conflict and also how the study alternatives may augment and/or complement existing and proposed future land use.

Existing land use patterns and future land use plans vary considerably from one community to another for the rail corridor area. Community comprehensive plans, zoning and The West Side Master Plan were all reviewed to determine existing and proposed future land use for the rail corridor and surrounding lands. Town planners in the communities were also contacted in to confirm land use plans and zoning.

4.11.1 Aquidneck Island Land Use

City Of Newport

Existing land use and zoning in vicinity of the rail ROW in Newport includes residential (R-10) and commercial-industrial. Future land use is consistent with the current zoning and land use for the area in Newport (City of Newport Planning Office). The rail line runs parallel to major roads in Newport, which bisected that part of the city many years ago. The rail ROW, along with the highways and major local roads form the transition between residential neighborhoods to the west of the rail and commercial and business land use to the east. The Newport/Pell Bridge is a major transportation artery, which directs visitor traffic into the City of Newport. Development of a bike path, and rail service alternatives with appropriate station locations and parking space can ease some of the weekend and seasonal (summer) traffic congestion as well as enhance visitor experiences on the Island.

Noise and safety concerns require attention along a 2400-foot stretch of residential land use as the ROW approaches the Gateway Center. Houses in this neighborhood are within 50-100 feet of the Rail. Further north between the Route 138 Newport/Pell Bridge ramps and Admiral Kalbfus Blvd, there are several high-density apartment houses within 100-feet of the ROW. Field observations indicate that the rail corridor is used frequently as a walking path and access to adjacent commercial outlets by residents of the apartment complex.

Newport Navy Station Lands

The rail corridor passes through, or adjacent to, approximately six miles of lands owned and controlled by the US Navy. The lands on Newport Navy Base are very heavily developed with the majority of land use devoted to administrative and logistical support, research and education, and housing. Former fuel supply storage and distribution facility sites are in various stages of clean-up and remediation. Two former navy landfill sites lie adjacent or in very close proximity to the rail ROW. Both McAllister Point and the North Melville Landfill (Naval Properties) are contaminated, and currently being assessed and remediated. Please see Section 4.5 for more detailed information on environmental remediation activities and sites.

The rail corridor runs parallel to Burma Road which is a major transportation route for Navy business and for the Melville Marina industrial and business area to the north of the Navy Lands. The planned route for the bike path along much of the Navy Lands will follow an existing bike lane constructed on Burma Road by RIDOT and the Navy.

Introduction of rail service and a bike path facility is not inconsistent with the Naval Station needs. The Navy employs approximately 7,800 military and civilian personnel and graduates 16,000 students annually from its training schools (AIPC, 2001). Development of a rail service alternative, and base-wide shuttle-bus service would improve transportation efficiency for Navy personnel living on and off the Island. Furthermore, there may be potential for the Navy to utilize the improved rail line for equipment and overland shipping purposes in the future. Rail service alternatives include a station location on the Navy base in the vicinity of proposed East Bay Community College of Rhode Island Campus in the vicinity of Coddington Cove.

Expansion of a bicycle facility from the existing bike lane on Burma Road to an island-length bike path would increase recreational opportunities for Navy personnel and their families, other island residents and visitors.

While there are potential benefits for the Navy from development of a rail service alternative and construction of a bike path, there are concerns. Base security is a critical issue since the terrorist attacks of September 11, 2001. In response to security concerns expressed during meetings with Navy Command personnel, the bike path alignment has been shifted away from sensitive security areas and it now travels through some navy residential neighborhoods. Measures to limit visual access some areas from the rail may include high screen-fencing, as well as using security fences to restrict access from the rail ROW, and construction of an overpass to isolate circulation of the Navy Base from rail activities.

Town of Middletown

Approximately 2.8 miles of the rail corridor is located along the coast in the Town of Middletown. Nearly three-quarters of the ROW here is bounded on both sides by Navy Properties. The Town has the Navy lands zoned as public or government owned and institutional in nature. The Town's future land use classification and mapping is consistent with current uses. Residential land with lots ranging from 10,000 to 20,000 square-feet are located along the rail corridor from McAllister's Point north to the Portsmouth Town line. There are several houses within 200-feet of the Corridor in the vicinity of Midway Pier. The Wanumetonomy Country Club and golf course, which abuts Navy lands, is located opposite McAllister's Beach, and is in close proximity to the ROW (approximately 200-feet). The Country Club, however, is on the east side of Burma Road while the rail is located on the west side of the Road.

Middletown has identified the rail corridor in the Middletown Comprehensive Community Plan as a potential greenway and the old Blue-gold Mussel Farm Pier as a shoreline public access and light recreational facility. The West Side Planning Inventory (AIPC, 2000) identifies the Navy fuel tank farms as potential public recreation areas should the Navy surplus the properties in the future. Such community recommendations and interests are consistent with a proposal to develop a bike path facility within the rail corridor.

Residential areas in Middletown are far enough away from the ROW so that they would not experience much, if any at all, in the way of impacts from reintroduction of rail service along the existing rail line. Development and/or enhancement of bikeway facilities along Burma Road which would connect to Newport and Portsmouth would provide increased passive recreational opportunities which have been identified as a need in the Town. The bike path may also result in some reduction of local traffic.

Town of Portsmouth

The Portsmouth Rail Corridor segment is the longest on Aquidneck Island with nearly eight miles of rail ROW. Surrounding land use ranges from Industrial and business at Melville Marina through recreation at three private golf courses, to large saltmarsh areas such as Boyd's Marsh and the Mussel Shoals area south of Mt. Hope Bridge. Residential developments occur in close proximity to the ROW at the Anthony Road area just west of the Sakonnet Bridge, and near Carnegie Abbey, Kings Grant and Portsmouth Abbey. As the rail ROW travels west and south from the Anthony Road area it bisects the Montaup Country Club and golf course, and skirts to the north of the Pocasset Country Club and golf course in the vicinity of Bay View Avenue. There are about a dozen houses on Bay View Avenue, north of the rail and west of Boyd's Marsh, which are within 200-feet of the rail.

A small neighborhood of about a dozen homes is within 100-feet of the ROW, just south of the Mt. Hope Bridge. From the neighborhood at the Mt. Hope Bridge, the ROW runs west of most residential areas with coastal wetlands and habitats to the west of the rail. At Weyerhaeuser Road, the ROW passes close to the Mt. Hope Marine Terminal location, and passes through the Kaiser industrial facility (now closed) at Willow Lane. From the Kaiser facility south to the Melville Marina and boat basin, the ROW travels to the west of sparse residential development with coastal habitats in very close proximity to the west. The Rail corridor

skirts along the coast and several hundred feet away (to the west) from educational facilities at Portsmouth Abbey and St. Philomena School.

At the Melville Marina, the rail corridor passes through Industrial land uses with boat building the predominant use along with the marina and associated businesses. East of the Marina facilities lie former Navy fuel tank farms 1 & 2, both of which are in the process of remediation and clean-up. (See Section 4.5 on Environmental Assessment)

From the Melville area south to the Middletown town line, the rail runs parallel along the shoreline, and to the west of Burma Road with the bike facility consisting of an existing bike lane along the shoulder of Burma Road. The bike lane and rail pass in close proximity to the Weaver Cove Boat Ramp, a State owned facility, and Carr Recreation Area owned by the Navy. Neither the bike lane on Burma Road, nor the rail, however, intersect these recreation facilities, although an access road constructed by the State is signalized and crosses the rail ROW for the Weaver Cove Site.

Town of Tiverton

Rail service related impacts in Tiverton would occur only if the rail alternative for Aquidneck Island, which includes connection to the planned MBTA rail service in Fall River, is constructed. Implementation of the Aquidneck Island Shuttle Service would not impact the Tiverton section of the ROW at all. However, if Aquidneck Island Shuttle Service is adopted, and it includes development of a bike path for the whole corridor, the bike path facility would have impacts within this community's neighborhoods.

Land use along the rail corridor in Tiverton ranges from industrial land at the State line in North Tiverton, small residential sections along areas immediately to the south and waterfront in the vicinity of the proposed Starwood Development at the former tank farm industrial site on Carey Lane. For the industrial lands in the north segment, introduction of rail service is not expected to present a conflict for the existing land use, and future land use classification is consistent with the current industrial use.

Residential areas in the northern segment along Bay Street through to Judson Street are not bisected by the ROW and are located to the east. Some houses along this stretch however, are within 100 - 200 feet of the ROW and would be subjected to noise impacts from rail operations. Several residences are within 100 - 200 feet of the ROW in the vicinity of Colony Terrace and Poplar Drive. Additionally, evidence of public use of access paths to the shoreline indicates potential safety issues with crossings of the ROW should rail service be reintroduced along this section of the rail corridor.

Creation of the Bike path in Tiverton would in all likelihood be perceived as a positive development for the Town. Presently there are no limited access, bicycle facilities in Tiverton, and the coastline is very scenic in the vicinity of the ROW. Bike path construction would establish a safe, non-automobile transportation link along the shoreline between Fall River and South Tiverton. The bike path facility would provide new outdoor recreation opportunities for Tiverton and possibly have some impact for reducing local automobile traffic trips. Many studies on bike path development impacts indicate that such facilities often result in either maintaining, or increasing residential property values for neighborhoods in the vicinity of a bike path. (Seattle Engineering Department, Seattle WA, 1987; National Park Service, 1992; The Conservation Fund and Colorado State Parks, 1994.)

4.11.2 Summary of Land Use and Neighborhood Cohesion Issues for Rail Corridor

Development of rail service alternatives and a bike path facility would result in land use impacts, some positive, and some negative. New rail service alternatives would involve trains moving through the outskirts of residential areas at speeds as high as 60 miles per hour. For most neighborhoods along the rail ROW, there is sufficient space and vegetation to buffer noise and air emissions. However, several small, residential neighborhoods primarily in Tiverton and Portsmouth are within 100 - 150 feet of the rail corridor. Approximately 2400-feet of ROW, includes about forty single-family residences in the Newport

neighborhood area from Van Zandt Avenue to the Gateway Center that are within 75-feet of the rail. A high-density apartment complex is also located within 100-feet of the rail in the vicinity of the Admiral Kalbfus Blvd. traffic circle. Safety and noise impacts will have to be addressed for these areas.

As the trains proposed for shuttle service are essentially single car, and self-propelled, both noise and air emissions will be relatively minor compared to a standard, diesel MBTA commuter train. For most areas, the small number of residential neighborhoods within 100-feet of the ROW, screening plantings and sound barriers, if justified, may be sufficient to reduce sound levels. This needs to be studied further.

The rail service alternatives provide for limited service hours, and would not run all night. For the High Service, On-island option during the summer months, a shuttle rail service would run from 6:30AM through 10:30PM with a total of 56 trains per day. During fall and spring, On-island train service would run from 6:30 Am through 8:30PM, and in the winter, On-island shuttle service would be provided from 6:30AM through 6:30PM with 52 and 24 train trips per day respectively. Please see Section 1 for more details on service alternatives and train trip frequency.

Rail service options as proposed, include a one or two-car train passing any given point along the rail corridor two - three times per hour during operating times. Implementation of rail service with these train trip frequencies could have a definite impact on some neighborhoods adjacent to the rail corridor. Although the rail is a pre-existing land use, and the rail lies on the periphery of residential areas, reintroduction of new rail service will change the character of some neighborhoods. These potential impacts will have to be addressed in more detail should the State choose to implement any of the development alternatives.

4.11.3 Train Station and Land Use Considerations

Construction and development of proposed station locations could have an impact on surrounding neighborhoods and land use patterns. The degree of impact is dependent upon current land use and zoning in the station area.

Impacts from train station operations may result in the following:

1. Increased automobile traffic to and from a station, which may result in congestion, parking problems, safety concerns, and increased noise;
2. Increased noise from departing and arriving trains and increases in exhaust fumes in the immediate area;
3. Light pollution from the need to provide parking lot, and train boarding lighting for safety and security purposes, and
4. Induced commercial development and pressure for zoning changes to capitalize on increased traffic and potential customers using train stations.

Station siting requires careful consideration to avoid creating conflicts with other existing land uses in the area. Stations should not be sited in existing neighborhoods nor too close to residential areas to avoid many of the impacts described. An assessment of existing automobile traffic patterns, level of service, and volume in the surrounding area needs to be done to determine how a projected increase from siting a station may impact existing infrastructure and traffic controls, as well as neighborhood safety and integrity.

The West Side Transportation Guide Plan identifies several potential train station locations on Aquidneck Island for future development. The Mount Hope area, Melville and the Newport Gateway were all categorized as highest priority for rail and intermodal transportation use. A train station in the vicinity of the Navy's Gate 4 and Coddington Highway was also identified as presenting potential for meeting Island transportation needs.

Newport Gateway Center
Proposed station locations for the On-island shuttle rail service include the existing Gateway Center on America's Cup Avenue in Newport which is on the edge of very heavily developed commercial and tourist businesses including hotels and conference centers, retail outlets, restaurants, and marinas. The close proximity of a densely populated residential neighborhood to the north and west, some of which contains historic houses, underscores the need for proceeding carefully with plans for expansion of the existing facility to accommodate any significant increase in passenger rail service.

CCRI, Navy Station
The site of a potential train station location on the Newport Naval Station is in the vicinity of Gate 4. This station facility would serve both Navy military and civilian personnel, and students and faculty at a proposed Community College of Rhode Island Campus. Discussion of plans for the location and construction of the campus are on-going between the Navy and the State of Rhode Island. Surrounding land use at the proposed station location is primarily industrial and administrative type support facilities, Navy education and some multi-family housing. Housing areas are set back far enough from the proposed station location as to have minor impacts. The site is also close to the site for the proposed Aquidneck Island Campus of the Community College of Rhode Island (CCRI). Siting of a train station in this vicinity would be consistent with most other existing and proposed land uses for the area, and would provide a transportation alternative for Navy military and civilian personnel, families and students attending the CCRI Campus.

Melville Marina Area
Existing land use and zoning for this station location is business and industrial. Development of the area is considered a high priority in local comprehensive plans and in West Side Island planning documents by the AIPC. An intermodal station, including rail development at Melville is recognized as providing many benefits to the Island's economy and also presenting the least impact by expansion of existing infrastructure and facilities. Siting of a train station at this location is consistent with other planning documents and recognized as having the highest priority within the West Side Transportation Guide Plan. Conflicts with any existing land use would be minimal. The proposed station location however, does show a minor freshwater wetland-edge incursion and impact, please see Section 4.1 for details.

Mount Hope/Terminal Road
This area in Portsmouth, which is located on Weyerhaeuser Road, and adjacent to the shoreline of Narragansett Bay is zoned as industrial. It has been used as the terminal for RIPTA ferry service and has very good potential for meeting intermodal transportation needs. Residential areas to the north are situated several hundred feet away from the proposed station location. The property is currently being used for industrial, fishing, and supply purposes, and has a fair amount of vacant area. It has its own access road off of Bristol Ferry Road. Development of this site would present very little impact to existing neighborhoods.

Anthony Road
This site presents opportunities for park and ride and intermodal train/bike path transportation primarily for visitors or commuters traveling to and from Tiverton, and southeastern Massachusetts. The proposed station location is within the present Route 24 ROW. If the relocation of Route 24 and the Sakonnet Bridge were to shift southward as proposed, some state land would be available for development of a train station at the location presented on the project figures and maps in the vicinity of Anthony Road. This station would also provide service to the Common Fence Point Community and neighborhood at the northern tip of Aquidneck Island in Portsmouth. The Station location would be in the vicinity of a demolished train station, which formerly served Tiverton and Aquidneck Island.

As the proposed station location would be within an existing highway transportation corridor and lie on the periphery of the neighborhood, there would be little disruption or impacts to the neighborhood and community here. Several houses may be within 200 feet of the station and appropriate screening for light and

noise may be necessary. This location will require additional study should rail alternatives be pursued by the State.

Tiverton Station
The Tiverton Station site proposed is located on lands zoned industrial and waterfront. It is the site of a former tank farm and adjacent to the coastline. A large condominium development is planned for this area, and known as the Starwood Development, and the developers have indicated their openness to having a station located on this site. Existing neighborhoods and houses are nearly a 1/4 mile away, and expected impacts are expected to be very minor, consisting of increased traffic on the outskirts only. The site has its own access road off the main road.

4.12 Open Space and Recreation Land

The existing rail corridor lies close or adjacent to several public and private recreation areas on Aquidneck Island. An analysis of state maps, at the Rhode Island Department of Environmental Management, of publicly owned, open space and recreation parcels was conducted to determine if the rail corridor or bike path alignment intersected any parcels. Aquidneck Island Land Trust maps, and community comprehensive plans were also reviewed for open space or recreation lands along the corridor. There appears to be two publicly owned recreation facilities and one potential open space parcel that would be directly or indirectly impacted by rail service alternatives or the bike path. The bike path alignment would impact the open space area, and the recreation facilities are adjacent to the rail corridor, and involve existing crossings over the rail ROW.

Two recreation parcels, both in Portsmouth, lie to the west of the rail ROW, along the shoreline. Weaver Cove is a state-owned public boat launching area located in the vicinity of Milepost 6.0. The facility has a signalized crossing of the ROW, and the ROW lies on the eastern edge of the facility. Carr Recreation Area, a Navy outdoor recreation facility, is located about 1/3 of a mile south of the Weaver Cove Site. Access to the Site is by Burma Road with a crossing of the ROW. The entire recreation facility lies to the east of the ROW, and like Weaver Cove, is bordered on the west by Narragansett Bay.

The bike path alignment is proposed to cross salt marsh and tidal areas west of the rail at Boyd's Marsh. Boyd's Marsh is reportedly owned by the State of Rhode Island, (personal communication, Tom Ardito, RIDEM) but was not purchased with recreation funds. The Army Corps of Engineers and RIDEM have selected Boyd's Marsh as a high priority for salt marsh restoration activities in New England. Initial restoration plans and activities are underway through a joint Federal/State/Local effort.

With the influx of Federal and State funding, it is likely that Boyd's Marsh will be designated as a permanent open space and conservation area. Plans for crossing the Marsh and tidal area will likely have to go through an intensive federal and state permit review process, though there may be interest in providing some public access and interpretive education signage in the area (personal communication with Tom Ardito, RIDEM). A carefully planned and constructed bike path facility could provide opportunities for public education on marsh restoration and the ecological and economic value of the habitat by incorporating educational plaques and signage within the design.

There are four privately-owned country clubs and golf courses along the rail corridor, three of which are located in Portsmouth, (please see Figures 3-PT through 6-P). The Montaup Country Club and the Pocasset Country Club golf courses are located adjacent to, or in close proximity to the Boyd's Marsh area in the vicinity of Milepost 12.0. The Carnegie Abbey Country Club Golf Course, also in Portsmouth, is located in the vicinity of Milepost 9.0, between Willow Lane and Barker Brook. The Wanumetonomy Country Club Golf Course is located in Middletown (Figure 10-MP) and adjacent to Navy Properties, but lies across Burma Road from the rail corridor and the bike path.

The rail ROW bisects the Montaup Country Club Golf Course by a length of approximately 3,000 feet as it approaches Anthony Road from the Boyd's Marsh crossing. The rail ROW skirts to the north and is separated

from the Pocasset Golf Course by a buffer of natural vegetation for a length of approximately 1,000 feet. The bike path is proposed to veer away from the ROW and the Pocasset Golf Course, northward through the Boyd's Marsh area.

Carnegie Abbey Golf Course (privately owned) lies adjacent to the ROW in Portsmouth. A clubhouse lies on the west side of the ROW while the golf course lies completely to the east of the ROW. The bike path alignment remains within the 80-foot ROW, and there is a private rail crossing at this location.

There are no existing public or private recreation or open space parcels adjacent to, or in close proximity to the Tiverton ROW Segment. The bike path uses existing roads for the southern part of the Tiverton Segment partly because of space (narrow cut) and wet conditions in the ROW there, but also because of the views of the Bay from the Poplar Drive area. The bike path alignment is proposed to cross a man-made beach and sand-spit area in the vicinity of the Starwood Development. Though this presents considerations for coastal resource protection and permitting, it is not a publicly-owned parcel, nor is it designated as open space or for recreation.

4.12.1 Recreation and Open Space Potential Impacts

Rail service development alternatives would have an impact on both private and public facilities along the rail corridor. The greatest impact would come from a summer season, high rail service alternative which, as proposed, involves about 54 train trips per day with a one or two-car light rail trains car passing through the area every twenty minutes. Bike path development impacts to recreation facilities would amount to increased pedestrian and bicycle traffic through and to the areas.

The Navy and State owned facilities are adjacent to the ROW and involve road-access crossings. Both sites, because they are recreational and family-oriented, present safety considerations for vehicle and also pedestrian crossings. Access to the rail ROW, due to it's bordering the facility, will need to be tightly controlled, especially because of the presence of very young children playing at the sites. Fencing may have to be provided, as well as gated crossings at both locations (there are no gates presently at the Navy crossing). Noise abatement may be needed at the Navy facility as overnight camping is one of the features.

Impacts at private golf courses will be felt primarily at the Montaup Country Club with over a half-mile of the ROW and bike path bisecting the golf course. There are two authorized crossing locations at the golf course, and with a high service train frequency of a train passing every 15 - 20 minutes, safety at the crossings is a concern. Sound barriers and buffer plantings will be needed as well as fencing to prevent accidental crossing of the ROW. The Carnegie Abbey Golf Course crossing presents slightly less concern for safety, as it involves only one crossing at the periphery of the facility, which can be controlled. The ROW does not bisect or come in contact with either the Pocasset or the Wanumetonomy golf courses. Due to distances and the presence of natural vegetation and a roadway (Burma Road at Wanumetonomy) acting as a sound barrier, the potential for impacts and safety concerns is very low.

The bike path will bring increased pedestrian and bicycle traffic through and to the recreational facilities. This can be a safety concern at a golf course because of the potential for being hit by a misdirected golf ball. The presence of a bike path in close proximity to the golf course can also augment and compliment the existing facilities there, by adding another dimension to recreation by providing hiking, biking and rollerblading opportunities nearby for the whole family. The presence of an island-long bike path which passes the Navy and State-owned recreation facilities can likewise add value to those facilities by increasing opportunities for diverse recreation experiences, and providing pedestrian-friendly linkages to other locations.

5.0 PUBLIC PARTICIPATION

Date	Met With	Advertised	Location
2/27/01	Newport Dinner Train Train Tour		Newport Dinner Train
3/16/01	Aquidneck Island Planning Commission- Kelly Woodward		Middletown Town Hall
3/16/01	Portsmouth Town Officials		Portsmouth Town Hall
3/16/01	Newport City Officials		Newport City Hall
3/16/01	Newport County Chamber of Commerce		Newport County Chamber of Commerce
3/21/01	Tiverton Town Officials		Tiverton Town Hall
3/26/01	Newport Navy Station-- Captain Ruth Cooper, Steve Hascam & Van Nguyen		Newport Navy Station
4/4/01	West Side Task Force Informational Meeting		Newport City Hall
4/10/01	Auidneck Island Planning Commission & West Side Task Force Joint Meeting		Middletown Town Hall
4/18/01	Newport Dinner Train w/ Newport County Chamber of Commerce, RIDOT, Project Team		Newport Dinner Train
6/19/01	***Public Meeting***	Providence Journal Newport Daily News Sakonnet Times	Roger Williams Univ. Conference Center
10/16/01	***Public Meeting***	Providence Journal Newport Daily News Sakonnet Times	Newport Harbor Hotel and Marina
12/11/01	Newport Navy Station		Newport Navy Station
1/8/02	Newport County Chamber of Commerce		Newport County Chamber of Commerce
1/17/02	Aquidneck Island Planning Commission		Aquidneck Island Planning Commission

Date	Met With	Advertised	Location
4/5/02	Charles Kane, Owner Mt. Hope Marine Terminal		Mt. Hope Marine Terminal
4/5/02	Brother Joseph John Walsh John Perriera		Portsmouth Abbey School
6/6/02	City of Newport		Newport City Hall
6/6/02	Town of Portsmouth		Portsmouth Town Hall
6/6/02	Town of Tiverton		Tiverton Town Hall
6/12/02	Town of Middletown		Portsmouth Town Hall
6/12/02	Newport Chamber of Commerce		Newport Chamber of Commerce
6/25/02	***Public Meeting***	Providence Journal Newport Daily News Sakonnet Times	Newport Ramada Inn

APPENDICES (UNDER SEPARATE COVER)

Appendix A Figures

Railroad Infrastructure Plans (57 sheets)
Opportunities and Constraints Plans (10 sheets)
Concept Plans (7 sheets)
Rail Corridor
Enlargement Plans and Perspectives
Environmental Studies (14 sheets)

Appendix B Photographs

Photographs taken at the rail corridor during inspections.

Appendix C Correspondence with Rhode Island Department of Environmental Management

Letter received from Rhode Island Natural Heritage Program